CALICO SOLAR

Submitted by:
Calico Solar, LLC

Calico Solar

PLAN OF DEVELOPMENT

CALICO SOLAR PROJECT
SAN BERNARDINO COUNTY, CALIFORNIA

Prepared for:
Bureau of Land Management
Barstow Field Office
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AASHTO – American Association of State Highway and Transportation Officials
ACEC – Area of Critical Environmental Concern
ACI – American Concrete Institution
AFC – Application for Certification
AI – Asphalt Institute
AISA – American Iron and Steel Institute
AISC – American Institute of Steel Construction Code
ANSI – American National Standards Institute
APE – Area of Potential Effect
AQMP – Air Quality Management District
ASNT-TC-1A – American Society of Nondestructive Testing
ASTM – American Society for Testing and Materials
ATC – Applied Technology Council
AWS – American Welding Society
AWWA – American Water Works Association
BA – Biological Assessment
BACT – Best Available Control Technology
BLM – Bureau of Land Management
BMP – Best Management Practices
BNSF – Burlington Northern Santa Fe Railroad
CAISO – California Independent System Operator
Cal-OSHA – California Occupational Safety and Health Administration
Caltrans – California Department of Transportation
CBC – California Building Code
CCR – California Code Regulations
CDCA – California Desert Conservation Area
CDCA – California Desert Conservation Area
CDD – California Desert District
CDFG – California Department of Fish and Game
CEC – California Energy Commission
CEQA – California Environmental Quality Act
CERCLA – Comprehensive Environmental Response, Compensation and Liability Act of 1980
CFR – Code of Federal Regulations
CNDDB – California Natural Diversity Database
CNPS – California Native Plant Society
CO - carbon dioxide

CPM – Compliance Project Manager
CRSI – Concrete Reinforcing Steel Institute
CUPA – Certified Unified Program Agency
DC – direct current
DESCP – Drainage Erosion and Sediment Control Plan
DIR – Department of Industrial Relations
DOSH – Division of Occupational Safety and Health
DTSC – Department of Toxic Substances Control
EA – Environmental Assessment
EIS/FSA – Environmental Impact Statement/Final Staff Assessment
ERDC – Engineer Research and Development Center
FAA – Federal Aviation Administration
FEMA – Federal Emergency Management Agency
FESA – Federal Endangered Species Act
GDHS – Geometric Design of Highways and Streets
GPD – Gallons per Day
gpm – gallons per minute
GSU – Generator Step-Up Unit
HMBP – Hazardous Materials Business Plan
HMSMP – Hazardous Materials Safety Management Plan
Hz – hertz
ICC – International Code Council
IIPP – Injury and Illness Prevention
JHAs – Job Hazard Analyses
kV – kilovolt
LGIA – Large Generator Interconnection Agreement
LID – Low Impact Development
LORS – Laws, Ordinances, Regulations, and Standards
LUO – Land Use Ordinance
LWCF – Land and Water Conservation
MDAQMD – Mojave Desert Air Quality Management District
MIA – Masonry Institute of America
MOU – Memorandum of Understanding
msl – mean sea level
MVA – mega volt amperes
MW –megawatts
MWA – Mojave Water Agency
NAAMM – National Association of Architectural Metals Manufacturers
NACE – National Association for Corrosion Engineers

NAHC – Native American Heritage Commission
NAP – Not A Part
NEPA – National Environmental Policy Act
NFPA – National Fire Protection Association
NHPA – National Historic Preservation Act
OHV – off-highway vehicle
OSHA – Occupational Safety and Health Administration
OSSF – On-Site Sewage Facility
PCU – Power Conversion Unit
PMPD – Presiding Member's Proposed Decision
POD – Plan of Development
PPA – Power Purchase Agreement
PPE – Personal Protective Equipment
RMP – Risk Management Plan
RO – Reverse Osmosis
ROW – Right-of-Way
RPS – Renewable Portfolio Standard
RWQCB – Regional Water Quality Control Board
SC – sediment Control
SCADA – Supervisory Control and Data Acquisition
SCE – Southern California Edison
scf – standard cubic feet
scfh – standard cubic inches of hydrogen per hour
SDG & E – San Diego Gas & Electric
SES – Stirling Energy Systems
SIS – System Impact Study
SLF – Sacred Lands Files
SS – soil stabilization
SSC – Species of Special Concern
SSPC – Steel Structures Painting Council
SWPPP – Storm Water Pollution Prevention Plan
SWRCB – State Water Resource Control Board
TC – Tracking Control
TDS - Total Dissolved Solids
UBC – Uniform Building Code
UPS – Uninterruptible Power Supply
USFWS – U.S. Fish and Wildlife Services
VAC – volts alternating current
VDC – volts direct current

WE – Wind Erosion
WSA – Wilderness Study Area

1. PROJECT DESCRIPTION

1.a. Introduction

Calico Solar, LLC (the Project Owner; Calico Solar), formerly SES Solar Six, LLC and SES Solar Three, LLC, plans to develop a solar facility (Project) with a nominal capacity of 663.5 megawatts (MW). The Project site is approximately 4,613 acres of undeveloped land within the Mojave Desert in San Bernardino County, California, which is located primarily on public land administered by the Bureau of Land Management (BLM) Barstow Field Office. The Project will generate approximately 563 MW using photovoltaic (PV) technology and approximately 100.5 MW using the SunCatcher concentrating solar power technology.

Construction of the Project is expected to begin in late 2011 and will be conducted in two phases. Phase 1 is located primarily south of the railroad and will include the main access road, the main services complex, the on-site substation, 275 MW of PV technology, the well (north of the railroad) and the waterline connecting the well to the main services complex. Phase 1 construction is expected to take approximately 24 months. Phase 2 is located north of the railroad and will include the remaining 388 MW of PV technology and 100.5 MW of SunCatchers and related facilities. Phase 2 construction is expected take approximately 24 months.

On December 1, 2010, the California Energy Commission (CEC) issued a decision approving and licensing the Project. On March 18, 2011 the Project Owner submitted to the CEC a petition to amend the CEC's license for the project. The CEC's decision is expected in early fall 2011.

The Project Owner has compiled this Plan of Development with, to the best of its knowledge, currently available information. This document is subject to change and will be modified as new information becomes available and as design drawings are brought closer to the final version.

1.b. Proponent's Purpose and Need for the Project

The primary purpose of the Project is to provide California utilities with 663.5 MW of clean, renewable, solar-powered electricity. The Project is needed to:

- Assist in meeting California's Renewable Portfolio Standard, which, based upon the Governor's Executive Order, specifies that retail sellers of electricity serve 33% of their load with renewable energy by 2020;
- Reduce greenhouse gas (GHG) emissions, when compared with existing fossil fuel-burning generating facilities, and assist California in meeting its ambitious GHG reduction targets;
- Reduce California's dependence on fossil fuels;
- Contribute to California's future electric power needs;

- Assist the California Independent System Operator (CAISO)[1] in meeting its strategic goals for the integration of renewable resources, as listed in its Five-Year Strategic Plan for 2008–2012 (CAISO 2007); and

- Provide other important benefits to California's environment and economy, including improving local air quality and public health, developing local energy sources, and diversifying the energy supply.

1.c. Generating Facility Description, Design and Operation

1.c.1. Project Location, Land Ownership Jurisdiction

The Project site is located in San Bernardino County in an undeveloped area of the Mojave Desert located approximately 120 miles east of Los Angeles, California, and 37 miles east of Barstow, California along Interstate 40 (I-40). Figure 1, Regional Context Solar Assessment Areas included in Section 6, Maps and Drawings.

The Project will be located on approximately 4,613 acres. The majority of the Project site, comprising approximately 4,604 acres, is on public lands administered by the BLM. The Project's well and a portion of the waterline are located on private land owned by Calico Solar. An access road is expected to be located partially on land owned by Elementis Specialties, Inc. and partially on the railroad's right-of-way. See Figure 2, Project Layout included in Section 6, Maps and Drawings.

Figure 3, Calico Solar Land Ownership Map and Table is included in Section 6, Maps and Drawings section of this document and shows ownership of privately owned lands in relation to the Project site.

1.c.2. Legal Land Description of Facility

1.c.2.1. Federal

The following is the legal description of the federal lands within the Project:

Within Township 8 North, Range 5 East, San Bernardino Meridian:

- Section 2: Lots 1 and 2 in the NE1/4, SE1/4;

- Section 8: That portion of the N1/2, N1/2N1/2SE1/4 southerly of the southerly right-of-way of the Burlington Northern Santa Fe (BNSF) railroad and northerly of right-of-way LA 0107127;

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[1] The CAISO is a non-profit public benefit corporation charged with operating the majority of California's high-voltage wholesale power grid.

- Section 10: S1/2, S1/2NE1/4 southerly of the southerly right-of-way of the BNSF railroad;
- Section 11: NE1/4 excluding the BNSF right-of-way, W1/2SW1/4NW1/4 southerly of the BNSF right-of-way, W1/2SW1/4, W1/2E1/2SW1/4, E1/2NE1/4SW1/4, N1/2SE1/4, E1/2SE1/4SE1/4;
- Section 12: All section excluding the BNSF right-of-way.
- Section 14: NE1/4NE1/4NE1/4, W1/2NW1/4, W1/2E1/2NW1/4, SE1/4SE1/4NW1/4 northerly of the northerly right-of-way of Interstate 40 (I-40);
- Section 15: N1/2N1/2, N1/2S1/2N1/2 northerly of the northerly right-of-way of I-40.

Within Township 8 North, Range 6 East, San Bernardino Meridian:

- Section 5: A portion of SW1/4SW/14, a portion of SW1/4SE1/4SW1/4;
- Section 6: A portion of lot 2 in the NE1/4, a portion of lot 2 in the NW/1/4, lot 1 in the NW1/4, lot 1 in the NE1/4, lot 2 in the SW1/4, lot 1 in the SW1/4, SE1/4;
- Section 7: All section excluding the BNSF right-of-way;
- Section 8: N1/2, SW1/4, NW1/4NE1/4SE1/4, NW1/4SE1/4, NW1/4SW1/4SE1/4, all portions westerly of SCE Transmission right-of-way;
- Section 17: The NW portion westerly of SCE Transmission right-of-way and excluding the BNSF right-of-way;
- Section 18: NE1/4 excluding the BNSF right-of-way, Lot 1 in the NW1/4, N1/2 Lot 2 in the NW1/4, a portion of S1/2 of lot 2 in the NW1/4, a portion of N1/2 of lot 2 in the SW1/4, S1/2 of lot 2 Northerly of the northerly right-of-way of I-40, lot 1 in the SW1/4 northerly of the northerly right-of-way of I-40, SE1/4 westerly of SCE Transmission right-of-way.

1.c.2.2. Non-Federal

The following is the description of the non-federal lands within the Project:

A) A WELL WITH A RADIUS OF 100 FEET LOCATED AT THE EAST HALF OF THE NORTHWEST QUARTER OF THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION ONE, TOWNSHIP 8 NORTH, RANGE 5 EAST OF THE SAN BERNARDINO BASE AND MERIDIAN (“POINT A”);

B) AN APPROXIMATELY 40 FOOT WIDE WATER LINE BEGIINING AT POINT A AND RUNNING DUE SOUTH PARALLEL TO THE EASTERN BOUNDARY OF SECTION ONE, TOWNSHIP 8 NORTH, RANGE 5 EAST TO THE SOUTHERN BOUNDARY OF SECTION ONE, TOWNSHIP 8 NORTH, RANGE 5 EAST;

C) AN ACCESS ROAD BEGINNING AT THE NORTHERN TERMINATION OF THE HECTOR ROAD EXTENSION RUNNING IN A NORTHWESTERLY DIRECTION THROUGH THE EAST HALF OF THE EAST HALF OF SECTION 9, TOWNSHIP 8 NORTH, RANGE 5 EAST OF THE SAN BERNARDINO BASE AND MERIDIAN TO THE SOUTHERN BOUNDARY OF THE BNSF RIGHT-OF-WAY, THENCE WEST ALONG THE SOUTHERN BOUNDARY OF THE BNSF RIGHT OF WAY TO THE WESTERN BOUNDARY OF SECTION 9, TOWNSHIP 8 NORTH, RANGE 5 EAST.

1.c.3. Total Acreage and General Dimensions of all Facilities and Components

The Project will be located on approximately 4,613 acres of land.

Table 1 below identifies the significant structures and equipment that will be constructed for the Project, including their dimensions.

Table 1 Summary of Significant Structures and Equipment

Description	Quantity	Length (feet)	Width (feet)	Height (feet)
SunCatcher	4,020	38 diameter		40
Administration building	1	60	70	17
Maintenance building	1	70	70	17
SunCatcher assembly building (temporary)	2	1,000	100	78
Well water storage tank and Fire Protection Water, 230,000 gallons	1	40 diameter		25
Demineralized water tank, 17,500 gallons	2	18 diameter		10
Potable Water Tank, 5,000 gallons	1	10 diameter		10
PV Tracker Block	2,140	280	170	9
2 MW Inverter Pad, each with two 1 MW inverters, one 2.3 KVA transformer to increase inverter output voltage to 34.5 kV for collection systems	282	33.5	15	9
PV Module	1,951,680	6.4	3.3	0.17
230 kV transmission line tower, double circuit with upswept arms	0 to 3	--	32	90 to 110

Description	Quantity	Length (feet)	Width (feet)	Height (feet)
Generator collection sub-panel; distribution panel, 42 circuit, 400-A, 600 V, with circuit breakers in a weatherproof enclosure	335	1	2.67	5
Generator collection power center, 2,000-A distribution panels with five 400-A circuit breakers and 1200A circuit breaker for 1 MVar capacitor bank	67	2.5	3.33	7.5
Collector group GSU transformer, 1,750 kVA, 575 V to 34.5 kV, with taps	67	6.67	7.5	6.67
Power Factor correction capacitor, 600 V, 1,000 kVAR, switched in five, each 200 kVAR steps	67	2.5	6.67	7.5
Open bus switch rack, 35 kV, 7 bay with seven 35 kV, 600-A, 40 kVA INT, circuit breakers, insulators, switches, and bus work (1 bay for SunCatchers and 6 for PV)	1	105	20	30
Shunt capacitor bank, 34.5 kV, 90 MVAR switched in six each 15 MVAR steps	1	15	8	20
DVAR compensation system in coordination with shunt capacitor banks – size to be determined by studies	1	60	12	16
Disconnect switch, 35 kV, 3,000 A, 200 kV BIL, group-operated	1	3	11	16
Power transformer, three phase, 100/133/167 MVA, 230/132.8-34.5/19.9 kV, 750 kV BIL, oil filled	6	15	35	23
Power circuit breaker, 242 kV, 2000A, 40 kA interrupting capacity	6	12	20	16
Coupling capacitor voltage transformer for metering, 242 kV, 900 kV BIL, 60 Hertz, Potential Transformer ratio 1,200/2,000:1	1	1	1	25

Description	Quantity	Length (feet)	Width (feet)	Height (feet)
Disconnect switch, 242 kV, 1000 A	2	10	25	25
230 kV dead-end structure	1	--	100	90

1.c.4. Power Plant Facilities, Photovoltaic Conversion Process

The photovoltaic effect is the basic process by which a PV module directly converts sunlight into direct current (DC) electricity. When light shines on a PV module, the light that is absorbed generates electricity.

1.c.4.1. PV Components

PV modules are generally composed of highly purified silicon impregnated with tiny amounts of other elements. The Project will use silicon crystalline modules. PV modules are factory assembled as a pre-wired, field-installable units requiring field mounting to a supporting structure and making simple electrical connections using factory installed terminals. PV modules are black or dark purple in color and are essentially non-reflective. Each module is constructed with tempered glass (or some other transparent material) on the front surface and has a protective and waterproof material on the back surface. The edges are sealed to insure watertight integrity and there is often an aluminum frame protecting the edges of the modules. The back of the module includes the provisions for electrical connections with pre-wired terminals. Modules utilized for these large grid-connected projects are similar in their physical characteristics; about 77 inches tall by 40 inches wide by 2 inches thick and typically weigh about 55 pounds. Modules of different manufacturers can, and often are, intermixed as may be required by supply and demand issues.

To maximize power output throughout the day, PV modules are usually mounted on tracking devices that change the orientation of the modules to optimize alignment with the sun's angle at any given time of the day. This Project will use a simple single-axis tracking system consisting of a series of shafts, upon which rows of modules are mounted. The shafts are supported by special bearings on steel posts, driven into the ground. A small (less than five horsepower) electric motor and sun-sensing control system rotates the shafts, which in turn rotate the rows of modules in small increments from east to west to maximize electrical production. See Figure 4 Typical PV Array and Figure 5 Schematic of Tracking System below.

Depending on terrain and similar circumstances, in which it would be impractical to install the shafting required for tracking an entire block, a small number of PV modules may be installed on fixed mounts. The fixed mounts are essentially the same as the tracking mounts except for the elimination of the bearings and the drive shafting.

Figure 4 Typical PV Array

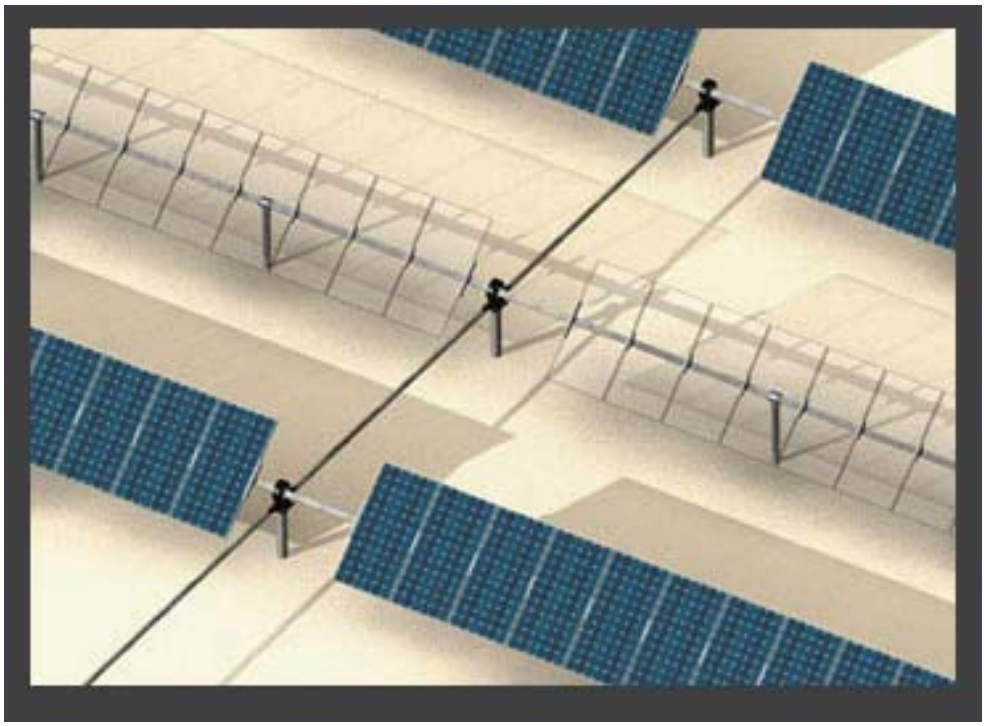

Figure 5 Schematic of Tracking System

Arrays of PV modules produce DC at approximately 600 to 1,500 volts, depending on design details and operating conditions. This DC is then converted to alternating current (AC) in power inverters, which are mounted on the inverter pads in large weather-protected metal cabinets. Aside from cooling fans or closed-cycle cooling system pumps, the inverters have

no moving parts and rely instead on a sophisticated control system that uses large transistors and capacitors. A combination of underground and above-ground wires transmits the electricity to the on-site substation. Inside the on-site substation, 34.5 kilovolt (kV) power will be increased to 230 kV. The on-site substation is in turn connected to the SCE interconnection point at the Pisgah substation. See Figure 6 Typical 2 MW Inverter below.

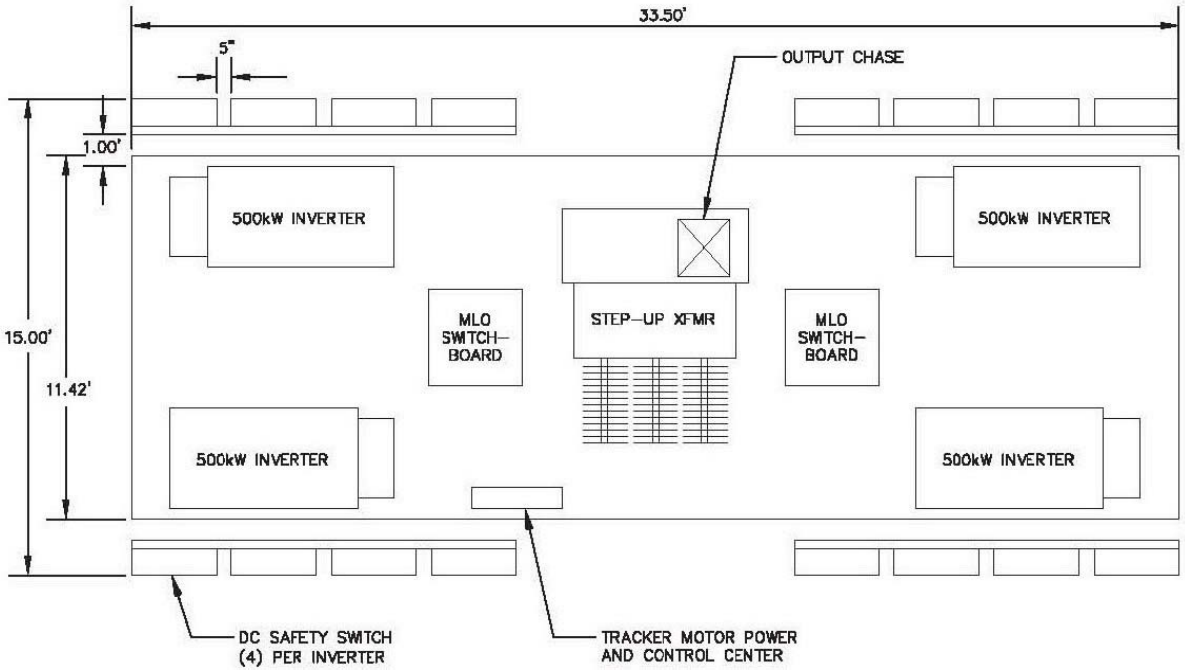

Figure 6 Typical 2 MW Inverter

An electrical single line diagram for the full project is included as Figure 7, Electrical Single Line Diagram in Section 6, Maps and Drawings.

1.c.4.2. Concentrating Solar Conversion Process

Concentrating solar power technologies are those that concentrate the sun's energy to produce heat; the heat then drives either a steam turbine or an external heat engine to produce electricity. SunCatchers, a type of dish engine technology, fall into the category of concentrating solar power.

1.c.4.2.1. SunCatcher Components

The SunCatcher is a 25-kW solar dish system, manufactured by Stirling Energy Systems (SES), designed to automatically track the sun to collect and focus solar energy onto a power conversion unit (PCU) that generates electricity with a Stirling Engine. The system consists of an approximately 38-foot diameter solar concentrator in a dish structure that supports an array of curved glass mirror facets. These mirrors collect and concentrate solar energy onto the solar receiver of the PCU. The dish is mounted on a 24-inch diameter pedestal that is hydraulically vibrated into the ground.

Stirling Engines are powered by the expansion of a gas when heated, followed by the compression of the gas when cooled. The Stirling Engine contains a fixed amount of gas that is transferred back and forth between a "cold" end and a "hot" end. The "displacer piston" moves the gas between the two ends, and the "power piston" is driven due to changes in the internal volume as the gas expands and contracts. The Solar Stirling Engine combines the standard Stirling Engine with a solar receiver. The SunCatcher solar receiver consists of an insulated cavity with an aperture that allows the solar energy to enter. Heat absorbed at the solar receiver drives the Solar Stirling Engine. See Figure 8 Stirling Engine Cutout below.

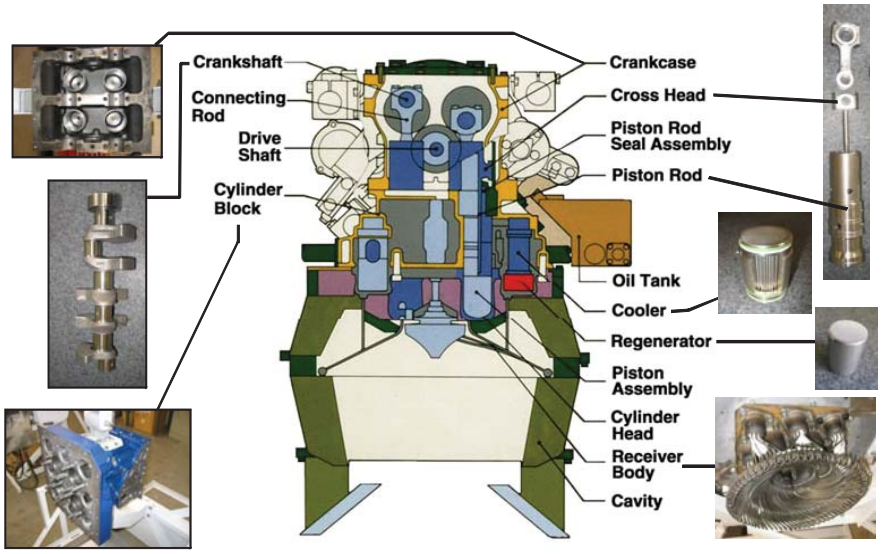

Figure 8 Stirling Engine Cutout

The SunCatcher PCU converts solar energy into electricity. The conversion process in the PCU involves a closed-cycle, 4-cylinder, 35-horsepower reciprocating Solar Stirling Engine utilizing an internal working fluid of hydrogen gas that is recycled through the engine. The Solar Stirling Engine powers an electrical generator that produces 25 kW net output after accounting for on-board parasitic loads at 575-volt alternating current, 60 Hz of electricity. The dimensions of the PCU are approximately 88 inches long by 63 inches wide by 37 inches high, with a weight of approximately 1,400 pounds. The PCU consists of six subsystems: solar receiver, Solar Stirling Engine, generator, cooling system, gas management system, and the PCU control system. See Figure 9 PCU Parts and Components below.

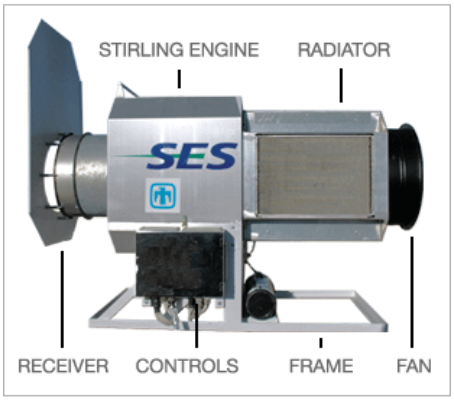

Figure 9 PCU Parts and Components

Each SunCatcher unit relies on hydrogen gas to convert solar thermal energy to mechanical and then to electrical energy. Hydrogen is delivered to the SunCatchers through either a distributed or a centralized hydrogen system. Under the distributed system, each SunCatcher would be equipped with a 196-standard cubic foot (scf) k-bottle that would replenish hydrogen gas lost within the gas circuit. Each SunCatcher would include an 82-scf high-pressure supply tank, 28-scf low-pressure dump tank, and a 489-scf local storage tank. For the centralized system, hydrogen would be distributed from the hydrogen storage tanks to individual compressor groups. Each compressor group would be electrically operated and would consist of a compressor and a high-pressure supply tank with a 29,333-scf capacity, delivering gas at approximately 2,760 psi. Each compressor group would also be equipped with a low-pressure dump tank with the same 9,900-scf capacity used to recover hydrogen from non-operational PCUs through a ¼" and ½" stainless steel return line. For the Centralized System, there are no other holding tanks or storage tanks in the compressor groups. Delivery of hydrogen throughout the system would be through pipelines.

SunCatchers are grouped together into 1.5 MW groups of 60 SunCatchers each. A 600-volt underground system is used to collect power from each 1.5 MW group. This power collection system combines the output from the SunCatchers and connects each group to a mid-voltage transformer with an output voltage of 34.5 kV. The output from these transformers is connected to the collection system and routed directly to the on-site substation. The power from the SunCatchers are conditioned to meet power quality requirements of the LGIA and CAISO by a series of capacitors. The on-site substation is in turn connected to the SCE interconnection point at the Pisgah substation.

An electrical single line diagram for the full project is included as Figure 7, in Section 6, Maps and Drawings.

1.c.5. Numbers and General Dimensions of Solar Array, Power Generation Units (Wet or Dry Cooling), Towers, Substations, Transmission Lines, Access Roads, Buildings, and Parking Areas

The Project will consist of:

- Power Generation Units:

  PV Tracker Blocks - PV Tracker Blocks are the basic building blocks of the PV arrays. Each basic Tracker Block would be similar in configuration and capability. The Tracker Blocks are made up of approximately 19 rows containing approximately 48 PV modules, totaling over 900 modules per Tracker Block. A basic Tracker Block will measure approximately 280 feet by 170 feet and occupy a space of approximately 1.1 acres. The size of each Tracker Block may be reduced as required by site characteristics such as boundaries, roads, topography, or similar constraints.

  Each Tracker Block normally generates sufficient DC energy to produce 250 KW of AC power at the on-site substation. A total of eight (8) Tracker Blocks combine to feed into one 2-MW inverter pad where the DC power is converted into AC power and stepped up to 34.5 kV collection voltage by a 2.3 MW medium voltage transformer. A total of 282 inverter pads will be installed on the site to handle the proposed 563 MW output from the PV units.

  SunCatchers - Approximately 4,020 SunCatchers producing up to 100.5 MW of electricity will be installed on the Project site. Each SunCatcher is 38-foot diameter solar concentrator in a dish structure that supports an array of curved glass mirror facets. The dish is mounted on a 24-inch diameter pedestal. Each SunCatcher will produce up to 25 kW net output of electricity at 575 volts. The Project will be electrically designed as 67 1.5 MW, three-phase, 60-hertz, solar groups. Each complete solar group will consist of 60 SunCatchers, which correlates to a 1.5 MW power block with a corresponding generator step-up (GSU) transformer. The medium voltage transformer will step the voltage up to 34.5 kV. Each SunCatcher group will occupy approximately 11 acres.

- Substation: The on-site substation will occupy approximately 15.5 acres.

- Transmission Line: A 230 kV transmission line will connect the on-site substation to the existing SCE Pisgah substation 0.09 miles outside of the Project site in the SCE transmission right-of-way.

- Roads: The paved main access road will be 24-feet wide (one 12-foot lane in each direction). The surface treated access roads/interior perimeter access roads will be designed with one 12-foot lane. These roadways will allow for a looped access to the main services complex, the PV arrays, and access to the on-site substation. SunCatcher maintenance roads will be one 8-foot lane, surface treated with a suitable non-toxic soil stabilizer. Secondary site access roads will be 20-feet wide (one 10-foot lane in each direction) and stabilized using a non-toxic soil stabilizer. A single 8-foot lane exterior perimeter roadway will be provided to allow local land owners and the general public access to the areas north and east of the Project site. See

Figure 10, Treated Arterial Roads in Section 6, Maps and Drawings. The layout of the various Project roads is shown on Figure 11, Project Access and Layout located in the Section 6, Maps and Drawings.

- Unimproved Module Access Points: The areas between the PV Tracker Block rows will alternate between rows of undisturbed areas and unimproved module access points. The unimproved module access points are anticipated to be used no more than four (4) times a year for washing of the PV modules and maintenance of the system.

- Buildings: The Project administration offices and personnel facilities will be located in a one-story administration building. The operation and administration building will measure approximately 60 feet long by 70 feet wide, and will be 17 feet tall.

  The maintenance facilities, shop, and warehouse storage will be located adjacent and adjoined to the administration building. The maintenance building will measure 70 feet wide by 70 feet long, and will be 17 feet tall.

  The temporary assembly buildings will be located within the designated main services complex. The assembly buildings will be situated on 17 acres of land and will be 1000 feet long by 100 feet wide by 78 feet in height.

  The water treatment structure will be located in the main services complex and will measure approximately 40 feet long by 40 feet wide by 14 feet in height; the structure will have a metal roof for shading purposes.

- Parking Areas: Transport trailer storage will be located next to the assembly building bays. These storage trailers will be used to house components for the PV arrays, as well as SunCatcher parts during the assembly phase of construction. The administration building will accommodate parking for approximately 125 vehicles. This parking lot will be paved with asphalt and provided with light fixtures which are consistent with Green Globes™ criteria for light pollution reduction.

- Construction Laydown Yard: A main construction laydown area will be installed within the main services complex and would be approximately 10 acres in size.

1.c.6. Temporary Construction Workspace, Yards, and Staging Areas

The Project will have a temporary 30 acre staging area directly adjacent to the main services complex. This area will consist of the following:

- Construction laydown area – 10 acres (1,100 ft x 400 ft);

- Assembly buildings and associated roads – 17 acres; and

- Miscellaneous access roads and open space – 3 acres.

The temporary construction facilities will be installed during the first few months of construction. The majority of these facilities will be located in the construction laydown yard adjacent to the main services complex. Project amenities will consist of portable office trailers, restroom facilities, meal rooms, limited parking areas, vehicle marshalling areas/traffic staging, and construction material/equipment storage areas. Construction power to the Project site facilities will be provided initially through the use of diesel generators until such a time when SCE will provide temporary service. See Figure 12, Utility Plan located in Section 6, Maps and Drawings. Diesel generators will continue to be used for construction in areas that cannot be serviced from the Pisgah Substation.

The designated laydown yard is on a slightly sloping area that will require minimum grading and fill operations to create a level area. Suitable foundation pads will be prepared for adequately supporting the office trailers. The construction laydown area will be utilized during the construction to provide storage and transfer of Project materials, worker parking, and minor sub-assembly operations.

For a detailed description of the temporary assembly and access roads, see Section 1.c.8, Ancillary Facilities.

1.c.7. Geotechnical Studies and Data Needs, Including Solar Insulation Testing

Geotechnical studies were completed in Q4 2009 and were performed by Terracon Consultants, Inc. Please see Appendix A, Geotechnical Engineering Report, dated January 4, 2010.

1.c.7.1. Physiographic Setting

The Project site is located in the east-central portion of the Mojave Desert Geomorphic Province in an area known as Hector. The area is bounded on the north by the Cady Mountains, Sleeping Beauty Peak to the east, Pisgah Crater to the south, and the Lake Manix and Troy Lake basins to the west (Reheis, et. al. 2007). The area is primarily characterized by alluvial zones and washes that gently to moderately slope to the south from the foot of the Cady Mountains. A few small knobs primarily comprised of volcanic rock rise out of the alluvial material at the base of the Cady Mountains. Quaternary-age basalt flows from the Pisgah Crater bound the southern portion of the area. Sediments from one of the high level fluctuations of Lake Manix overlap the western portion of the site to elevations of approximately 1,825 feet mean sea level (msl). Deposits from the Lake Manix basin suggest lake fluctuations that began during the middle Pleistocene and continued though most of the Late Pleistocene (Jefferson 2003).

The topography of the Project ranges in elevation from approximately 2,280 feet msl on the north side down to 1,800 feet msl in elevation in the southwest corner.

1.c.7.2. Local Geology

The site is located northwest of the Pisgah Crater, also known as Pisgah Volcano. The volcano is the youngest vent in the Lavic Lake volcanic field. It is speculated that there may have been activity at this site as recent as 2,000 years ago, though more likely 20,000 to 50,000 years ago. The lava flows extend over 10 miles from the cone and are visible at the

ground surface at some locations within the Project boundary. The Project site is located generally on a gently sloping alluvial surface.

1.c.8. Ancillary Facilities (Administrative and Maintenance Facilities and Storage Sites)

The majority of ancillary facilities, including the administration building, maintenance building, water treatment structure and temporary assembly buildings, will be located in the main services complex, which is south of the railroad. The facility on-site substation and partial switchgear will be located south of the railroad, adjacent to the Pisgah substation. The only ancillary support facilities that will be constructed north of the railroad will be the main water well pump and hydrogen generating station. See Figure 13, Calico Solar Main Services Complex in Section 6, Maps and Drawings.

1.c.8.1. Buildings

All buildings will be constructed in accordance with the current California Building Code (CBC) and other applicable laws, ordinances, regulations, and standards (LORS).

The administration building will be a one-story building and will contain administration offices, personnel, facilities, the control room, meeting and training rooms, engineering offices, a visitor's room, and support services. The maintenance building will contain maintenance shops and offices, PCU rebuild areas, maintenance vehicle servicing bays, chemical storage rooms, and warehouse storage for maintenance parts to service the PV Tracker Blocks and SunCatchers. The administration building and the maintenance building are adjoining facilities and may sometimes be referred to collectively as the operations and maintenance building.

A shaded water treatment structure will be located adjacent to the maintenance building. The water treatment structure will house water treatment equipment and safe storage areas for water treatment chemicals. A motor control center for the water treatment equipment and pumps will be located within this structure. Two wastewater evaporation ponds designed for water treatment system wastewater containment will be installed immediately adjacent to the water treatment facility. A fire protection water pump and a diesel standby power generator will be located adjacent to the maintenance building.

The administration and maintenance buildings will be manufactured buildings and will be painted with BLM's Carlsbad Canyon color per the BLM Standard Environmental Colors chart. The water treatment building and the water holding tanks, including the potable water, well water/fire protection water, and demineralized water tanks located at the main services complex will also be painted with the Carlsbad Canyon color.

SunCatcher assembly will be performed on-site in two temporary structures. The primary purpose of the assembly buildings will be assembly of the SunCatcher major components; the main beam assembly and trusses, the pedestal trunnion, mirrors, wire harnesses, control systems, and the calibration of the mirrors and control systems before field installation. Each assembly bay will be equipped with an automated platform on guide rails to move the SunCatcher through the assembly process. The exterior material for the assembly building will be a fire-retardant vinyl fluoride film with ultraviolet blocking characteristics and will be

chemical and weather resistant. The exteriors will be painted Carlsbad Canyon to match the other structures. The assembly buildings will be decommissioned and salvaged after all SunCatchers have been installed.

Electric service for the main services complex will ultimately be obtained from SCE. Electric power will be provided via a circuit entering the site from Hector Road and routed along the main access road. Communications service for the main services complex will be obtained from the local phone company. Communications service will be provided via an overhead service from existing underground communications lines located on the north of I-40 near the extension of Hector Road. See Figure 12, Utility Plan located in Section 6, Maps and Drawings.

1.c.8.2. Substation

The on-site substation will ultimately occupy approximately 15.5 acres for full Project operations and is located in Phase 1 of the Project on the eastern boundary, adjacent to the Pisgah substation. It will be constructed in phases similar to the Project. The equipment to be located in the substation is described in detail as the last nine items in Table 1, Summary of Significant Structures and Equipment. At the complete build-out of the Project, there will be six 167 MVA step-up main transformers (five for PV power and one for the SunCatchers) to accept power from the multiple 34.5 kV collection circuits from the PV arrays and the SunCatcher groups. After passing through the various protective and isolation devices, the PV power will feed directly into the main transformers with no further power conditioning required to meet the requirements of CAISO as detailed in the LGIA. In order to meet the requirements of CAISO, the power from the SunCatchers requires further conditioning by switching shunt capacitors banks in and out as required for VAR control since the induction alternators do not inherently have the capacity to satisfy this requirement. The on-site substation will also include a small enclosure to accommodate local control and metering functions.

1.c.8.3.*Water Tanks*.

The Project water tanks will be at-grade steel and/or polyethylene tanks. The water treatment system will consist of a 230,000 gallon raw water tank with a permanent booster pump station, a potable water treatment system, a ground-set steel or polyethylene 5,000 gallon potable water storage tank, a booster pump station to accommodate potable water needs and fire-flow requirements, a disinfection system, a demineralized water treatment system for mirror/module washing water, two 17,500 gallon polyethylene storage tank for demineralized water storage, chemical storage, reject water, sludge disposal and evaporation ponds, various support piping, valves, and miscellaneous equipment to support the system.

The steel water storage tanks will be electrically-grounded with suitable stem wall foundations, reinforced-steel bar mats and proper corrosion protection coatings. All tanks, foundations, and piping connections will be designed and constructed to the appropriate standards for contents and seismic zone considerations. Anchor bolts will be used as required. Chemical storage tanks will be of shop-fabricated, double-walled construction that meets all applicable LORS. These tanks, as well as any portable drums, will be provided with appropriate anchors or cradles and placed within secondary spill containment basins.

1.c.9. Water Usage, Amounts, Sources (During Construction and Operations)

1.c.9.1. Water Source

The Project Owner has a primary and a potential alternate water source for the Calico Solar project.

The Project site lies within the Lavic Groundwater Basin. The primary water source for the Project will be supplied from a well located on a parcel owned by the Project Owner in the northern portion of the Project site. The water from the well will be transported via an approximately 8,200 ft. underground waterline to the main services complex. The Project Owner has obtained all necessary permits to use the well during construction and operation. The water will serve all Project needs during construction and operation, including dust control, potable uses, fire protected, and mirror and panel washing.

Testing has demonstrated that this well has sufficient water supply and quality to satisfy the Project's needs. Aquifer testing indicated that groundwater extraction for the Project will not adversely affect the Lavic Groundwater Basin's water quality during construction or operation. Use of the well as the Project's water supply is not anticipated to affect water quality of the basin because pumping at the rates needed will result in limited drawdown over the duration of operations and the zone of influence is relatively small. Therefore, pumping at the well would have a low probability of causing movement of water that could be of poorer quality to replenish the zone of influence. See Appendix B, Well Installation, Sampling and Aquifer Testing, dated May 14, 2010.

The main well pump located north of the railroad will provide the necessary volume of water to support the project construction and operational needs. The well will be pumped and transferred within an underground 6 to 8 inch steel pipe that will traverse south to the main service complex collection tank(s).

Chambless Water Services, Inc. has been identified as potential backup water source for the Project.

1.c.9.2. Water Usage and Amounts

The annual water use for construction will not exceed the CEC-approved condition limit of 145 acre-feet per year (AFY). The annual water use during the operational phase will not exceed the CEC-approved condition limit of 21 AFY.

Table 2, below provides both the expected maximum water usage rates and the annual average usage rates during Project operations.

Table 2 Water Usage Rates for Project Operations

Water Use	Daily Average (gallons per minute)	Daily Maximum (gallons per minute)	Annual Usage (acre feet)
Equipment Water Requirements			
PV Panel Washing	4.2	14.9	5.8

Water Use	Daily Average (gallons per minute)	Daily Maximum (gallons per minute)	Annual Usage (acre feet)
SunCatcher Mirror Washing	1.6[1]	5.7[2]	2.2[3]
Water Treatment System Discharge			
Brine to Evaporation Ponds	2.3	12.8[4]	3.9
Potable Water Use			
For drinking and sanitary water requirements	2.0[5]	4.4	1.7[6]
Soil Stabilizer			
Water mixed with Soiltac for dust control	4.5	15.8[7]	6.1[8]
Hydrogen Generation			
Electrolysis water requirements	0.018	0.06	0.025[9]
Totals	**14.6**	**53.63**	**19.725**

1 Based on washing all of the dishes each month with an average of 10.3 gallons of demineralized water per wash and 21 work days per month.
2 Assumes one 500 gallon water tanker is filled over 20 minutes.
3 Based on all 4,020 SunCatchers experiencing 12.3 washes per year.
4 Based on the maximum amount of demineralized water required for mirror washing and assumes a decrease in raw water quality requiring an additional 40 percent of system discharge.
5 Assumes 17 gallons per person per day for 112 people.
6 Assumes a six-day work week and average daily usage.
7 Based on filling a 2,000 gallon tanker truck 6/7 full of water over 1 hour.
8 Assumes 6:1 mix of water to Soiltac applied to 1,245 acres of road every 2 years.
9 Assumes 195 scf of hydrogen generated per year per dish and 1.5 liters of water consumed per m^3 of hydrogen generated.

The following types of water will be required for the project:

- SunCatcher Mirror / PV Module Washing: Demineralized water will be used for SunCatcher mirror and PV module washing. The Project's Reverse Osmosis (RO) system will produce demineralized water with total dissolved solids (TDS) of less than 20 mg/L that will be stored in the demineralized water tank until used for such washing.

- Potable Water: Potable water will be derived from the primary water source and properly treated to applicable safe drinking standards. Potable water will be stored in a 5,000 gallon water storage tank that is dedicated for that use only.

- Fire Protection Water: The main services complex will include an approximately 230,000 gallon raw water storage tank that will be used to store water for several applications, including the reserve for supplying water for fire protection needs. This volume of water will meet all LORS, including the County of San Bernardino Fire District requirements for fire protection water on the site. Emergency water may be trucked in from local municipalities. The Project Owner would seek agreements at the time of the emergency.

- Dust Control Water: Water will be used for dust suppression in the areas disturbed during construction activities for the primary access routes, construction laydown areas, grading of the sites for the main services complex and the substation sites, as

well as any necessary clearing areas for the construction of each Tracker Block and SunCatcher group. Water trucks will be used to provide dust suppression throughout the duration of the construction and operations phase of the Project. Since a polymeric sealant will be used to seal unpaved roads, the requirement for water as a dust suppressant will be greatly reduced.

1.c.10. Erosion Control and Stormwater Drainage

The Project site can generally be split into two distinct drainage patterns. The first area is north of the railroad and slopes 1% to 5% in a south-southwesterly direction. The second area is south of the railroad and drains in a westerly direction. There is evidence that an alluvial fan or plain stretches across the entire site. The mountainous area to the north generates run-off, creating run-on conditions for the Project site.

A hydrology and hydraulics study was performed for the original project site, which encompassed a larger area than the current project site. Refer to Appendix C, Hydrologic and Hydraulic Study. A number of well-defined washes cross the Project site. Several of these washes convey the larger off-site flows through the culverts at the railroad and I-40. Others are smaller and convey on-site runoff to eventually join with larger washes. Several areas of the site also exhibit sheet flow conditions in areas where well-defined natural channels do not exist. Flooding conditions are likely on the site during short, intense thunderstorms. Given the small area of the on-site watershed in comparison with the larger off-site watershed, on-site flow peaks may pass before the off-site flows reach the Project site. Since thunderstorms typically cover small geographic areas, it is possible that localized flooding may occur in some parts of the site while other parts remain unaffected.

The Project will include BMPs to control and treat stormwater discharges from the Project site. Project Owner shall develop and implement a Drainage Erosion and Sedimentation Control Plan (DESCP) to reduce potential erosion and sedimentation impacts and a Storm Water Pollution Prevention Plan (SWPPP), which will also discuss mitigation of potential soil loss from the Project.

The temporary erosion and sedimentation control measures to be used during construction will be designed to prevent a change in the amount of sediment being displaced and carried off-site by storm water runoff. Before beginning excavation activities, berms, silt fences, straw bales, or other BMPs will be constructed/installed along the perimeter of the Project, where minor runoff to off-site areas could occur. During construction, the extent of earth disturbances will be minimized as much as is practical. Sediment control devices will be installed per BMP protocols to control sediment from construction operations for the major site runoff discharge.

Diversion ditches and/or berms will be constructed as necessary to divert runoff from off-site areas around the main service complex construction site. Temporary BMP control measures will be maintained as necessary throughout the construction period.

During Project operation, a storm water drainage system designed to match existing drainage patterns and meeting all local regulations will collect and direct all rainwater from the entire Project site, managing the flow through the use of existing dry washes, swales, ditches, culverts, berms and site grading to the pre-development site discharge location.

1.c.11. Vegetation Treatment and Weed Management

The Project will incorporate measures to reduce impacts to native vegetation and to control non-native weeds to the maximum extent practicable.

Disturbance of native soils and vegetation will be minimized by reducing access and construction areas to smallest practical dimensions. Prior to construction of the PV portion of each phase of the Project, the brush would be trimmed to a minimum height of 3 inches above ground as well, leaving the existing native plant root system in place to minimize soil erosion. After this initial trimming, the areas between PV rows would alternate between undisturbed areas and areas to be used as unimproved module access points, which would be accessed up to four times a year. Installation of the PV Tracker Blocks would be completed in such a way as to minimize the need for site grading. During operations, vegetation trimming would be limited to that necessary to prevent interference with operation of PV Tracker Block.

Brush trimming would be conducted between alternating rows of SunCatchers and would consist of cutting the top of the existing brush while leaving the existing native plant root system in place to minimize soil erosion. The trimming would occur prior to construction and would be done to a minimum height of 3 inches above ground. The areas between SunCatcher rows would alternate between undisturbed areas and maintenance roads. During operation, natural vegetation would be trimmed in the area of each SunCatcher (to minimize shading on SunCatchers and prevent potential brush fire hazards), as well as on either side of the surface-treated arterial roadways.

The Weed Management Plan, located within the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP), is included in this document as Appendix D. This document is intended to provide: (1) monitoring, preventative, and management strategies for weed control during construction activities at the Project; (2) control and management of non-native weeds in areas temporarily disturbed during construction where native seed will aid in site revegetation; and (3), a long-term strategy for non-native weed control and management during the operation of the Project.

1.c.12. Waste and Hazardous Materials Management

The Project will generate a variety of non-hazardous and hazardous wastes during construction and operation.

1.c.12.1. Construction Waste Management

During construction, inert solid wastes may include recyclable items such as paper, cardboard, solid concrete, concrete block, metals, wire, glass, Type 1 to 4 plastics, drywall, and wood. Non-recyclable items include insulation, other plastics, food waste, roofing materials, vinyl flooring and base, carpeting, paint containers, packing materials, and other construction wastes. Management of these wastes will be the responsibility of the construction contractors. Typical management practices required for contractor waste include recycling when possible, proper storage of waste and debris to prevent wind dispersion, and weekly pickup of waste with disposal at a local approved landfill.

It is expected that a 40-cubic-yard container will need to be emptied on a weekly basis during the construction of the buildings and once a month thereafter. Recyclable materials will be separated into labeled bins and removed from the site as needed. This construction waste is not expected to have a significant effect on public health or cause adverse effects on local landfill capacity. Table 3 Summary of Construction Waste Streams and Management Methods, provides an overview of the waste streams anticipated for the construction phase of the Project.

Any wastes classified as hazardous, such as solvents, degreasing agents, concrete curing compounds, paints, adhesives, chemicals, or chemical containers, will be stored and disposed of as required by local and state regulations. Material quantities of hazardous wastes are not expected. Lubricating oils generated from the construction vehicles will be recycled at local approved recycling facilities.

Table 3 Summary of Construction Waste Streams and Management Methods

Waste Stream and Classification	Origin and Composition	Estimated Amount	Estimated Frequency of Generation	On- Site Treatment	Waste Management Method
Construction waste – non-hazardous recyclable	Scrap wood, steel, glass, plastic, and paper	40 cubic yards per week	Intermittent	Segregation into composition type; store for less than 30 days	Dispose to landfill or recycling facility
Construction waste – hazardous	Empty hazardous material containers	1 cubic yard per month	Intermittent	Store for less than 90 days	Dispose to hazardous waste disposal facility
Construction waste – hazardous	Solvents, used oils, paint, oily rags, cleaners, and adhesives	100 gallons	Every 90 days	Store for less than 90 days	Dispose to hazardous waste disposal facility
Construction vehicles – hazardous	Waste oil including used motor oil, transmission fluid, hydraulic fluid, and antifreeze	100 gallons	Every 90 days	Store for less than 90 days	Dispose to hazardous waste disposal facility or recycle
Spent batteries – hazardous	Lead acid and alkaline	20 per year	Intermittent	Store for less than 90 days	Dispose to recycling facility
Storm water from construction – non-hazardous	Surface runoff (water, inert material, dirt and concrete particles)	TBD Intermittent – during rainfall events	Intermittent	None	TBD
Residual solids from retention pond and	Soils sediment and concrete	50 cubic	Intermittent	Spread over site	Excavate as needed per

Waste Stream and Classification	Origin and Composition	Estimated Amount	Estimated Frequency of Generation	On- Site Treatment	Waste Management Method
temporary perforated risers	particles	yards			SWPPP
Sanitary waste – non-hazardous	Portable chemical toilets sanitary waste	250 gallons per day	Periodically pumped to tanker truck by licensed contractor	None	Ship to sanitary water treatment plant
Demolition waste - non-hazardous	Concrete and rebar	TBD	Generated during demolition of SunCatcher assembly buildings	None	Dispose to non-hazardous waste landfill or recycling facility

1.c.12.2. Operations Waste Management

During operations, inert solid wastes generated at the Project will be predominantly office wastes and routine maintenance wastes, such as scrap metal, wood, and plastic from surplus and deactivated equipment and parts. Scrap materials such as paper, packing materials, glass, metals, and plastics will be segregated and managed for recycling. Non-recyclable inert wastes will be stored in covered trash bins in accordance with local ordinances and picked up by an authorized local trash hauler on a regular basis for transport and disposal in a suitable landfill area. Table 4 Summary of Operation Waste Streams and Management Methods, provides an overview of the waste streams anticipated for the operation.

Table 4 Summary of Operation Waste Streams and Management Methods

Waste Stream and Classification	Origin and Composition	Estimated Amount	Estimated Frequency of Generation	On-Site Treatment	Waste Management Method
Office and packaging materials from supplies deliveries – non-hazardous	Paper, wood, plastic, and cardboard	10 cubic yards per week	Intermittent	Segregation into composition type; store for less than 30 days	Weekly collection for recycling and/or approved waste disposal
Sanitary wastewater solids – non-hazardous	Rest rooms and sanitary waste	4,000 gallons per month	Intermittent	Store for less than 90 days	Dispose to sanitary waste disposal facility
Spent batteries – hazardous, recyclable	Lead acid, alkaline, gel cell, nickel, and cadmium	250 units per month	Intermittent	Store for less than 30 days	Dispose to authorized waste recycling facility

Waste Stream and Classification	Origin and Composition	Estimated Amount	Estimated Frequency of Generation	On-Site Treatment	Waste Management Method
PCU oil[1] – motor oil – hazardous, recyclable	PCU overhaul	5 gallons per month	Intermittent	One 100 U.S. gallon tank for filtering and re-use in PCU	Recycle
PCU coolant – ethylene glycol – hazardous	PCU overhaul	5 gallons per month	Intermittent	Store for less than 90 days	Dispose to authorized waste disposal facility
PCU hydrogen gas – non-hazardous, recyclable	Refill k-bottles in place	15 bottles per month	2 times per year per SunCatcher	Store for less than 90 days	Empty k-bottles returned through supplier
Oily absorbent and spent oil filters – hazardous, recyclable	PCU and hydraulic equipment overhauls	One 55-gallon drum per month	Intermittent	Store for less than 90 days	Dispose to authorized recycle facility
Oily rags – non-hazardous	PCU and hydraulic equipment overhauls	One 55-gallon drum per month	Intermittent	Store for less than 90 days	Launder at authorized recycle facility
Used hydraulic fluid, oils and grease – hazardous, recyclable	PCU and hydraulic equipment overhauls	Less than 10 gallons per month	Intermittent	Store for less than 90 days	Dispose to authorized recycle facility
Demineralized water treatment wastewater salt cake – non-hazardous or designated waste	Reverse Osmosis discharge process – mineral deposits and salts	65,750 pounds per year	Intermittent	Evaporative pond containment	Non-hazardous waste disposal facility

1.c.12.2.1. Waste From Water Treatment System

The water treatment wastewater discharge generated by the demineralization equipment contains relatively high concentrations of TDS. Final wastewater discharge is a combination of brine (accumulated salt deposits) and concentrated minerals generated by the demineralization process. All wastewater generated by the demineralization process will be discharged to concrete-lined evaporation ponds. Two ponds will be constructed, each sized to contain 1 year of discharge flow, the volume for the 100 year 24-hour storm and 2-foot freeboard. A minimum of 1 year is required for the water treatment waste to undergo the evaporation process. The second pond will be in operation while the first is undergoing evaporation. The two ponds will alternate their functions on an annual basis. The accumulated solids in each alternating pond will be scheduled for removal during the

summer months (when evaporation is at its highest rates) in order to achieve maximum solids removal.

TDS in the natural well water fluctuates seasonally and can range in concentration of 800 – 1,350 mg/L. The assumed TDS concentration of the reject water may be up to four to five times that of the natural well water concentration and is expected to reach 3,600– 6,000 mg/L throughout the seasonal changes. Please refer to Appendix B, Well Installation, Sampling and Aquifer Testing.

Solid waste from the Project's water treatment system will be trucked off-site from the evaporation ponds as a low-moisture cake. Based on the presumed well water TDS of 810 mg/L, an estimated 65,750 pounds per year of salt cake will be trucked off-site to an appropriate landfill or recycled. The waste is anticipated to be non-hazardous. The full 65,750 pounds will be scheduled for removal at the end of the evaporation process within each pond alternating cycle. The type of vehicle proposed for use in hauling the solids off-site has a capacity of 20 tons. Therefore, approximately two loads will be required per year.

1.c.12.2.2. Waste From Sanitary Wastewater System

The expected daily sanitary wastewater flow from the Project ranges from an average of 5,500 gallons to a peak of 6,600 gallons which will be treated at the on-site sanitary wastewater system. Sanitary wastewater generated at the facility cannot be conveyed to an existing sewage facility or pipeline as there are no public or private entities that manage sanitary wastewater flows for locations in the vicinity of the Project site. The wastewater generated at the main services complex will be discharged into a sub-surface wastewater disposal system with septic tanks and associated leach fields, and will be designed in accordance with the applicable LORS, including San Bernardino County, California State Regional Water Quality Board, and the Department of Health Services.

The sanitary wastewater system consists of a septic tank and leach fields located at the main services complex. The septic tank is a small-scale sewage treatment system common in areas with no connection to main sewerage pipes provided by private corporations or local governments. Periodic preventive maintenance is required to remove the irreducible solids that settle and gradually fill the tank, reducing its efficiency. The septic tank will require annual inspections to monitor for the buildup of solids and sludge. Once the available storage volume in the septic tank has been reduced by 25-percent, the sewer sludge shall be pumped from the septic tank and transported for disposal at an approved off-site disposal facility.

From the septic tank, the clarified liquid effluent will be disposed in sanitary leach fields. The leach field system will be designed as two independent leach systems, each sized to dispose of 100 percent of the system effluent from the septic tank. The installation of two independent leaching systems will allow for one of the leach field systems to be used for a period of one year and then the distribution valve would be switched over to the second leach field system which would then serve as the leach field for the next year. The leach field that was being used will be closed down and will lie fallow and recover from the bacterial loading it has received during the previous year. This process of alternating the two leaching systems every year under normal usage should enable the leach fields to last indefinitely.

The leach field being utilized will get a regular flow of bacteria from the fluids exiting the septic tank. This bacterium creates organic slimes in the soil, which potentially can clog the soil pores and cut down on the absorption capacity of the soils. Periodic inspections and maintenance of the leach fields will provide assurance the fields can properly function and not cause adverse impacts to the upstream septic systems and general environment. The required leach field area is estimated to be approximately 1,100 square-feet (0.025 acre).

To ensure that no hydrocarbons enter the leach field, the sinks and showers in the maintenance facility shall be plumbed to the wastewater recycling system that treats the equipment wash down water. The septic tank and leach filed will be designed to meet the requirements of the RWQCB and the San Bernardino County Public Health Department and will meet operation and maintenance guidelines required by the California Department of Public Health.

1.c.12.3. Hazardous Materials Management

Calico Solar will implement a Hazardous Materials Safety Management Plan (HMSMP) that has been developed for the Project and is included in this document as Appendix E. The HMSMP includes procedures for hazardous materials handling, use and storage; emergency response; spill control and prevention; employee training, and record keeping and reporting. See Table 5, Hazardous Material Use and Storage During Construction and Table 6, Hazardous Material Use and Storage During Operation provide a summary of the hazardous materials to be used, handled and stored on the Project site during construction and operation, respectively.

Table 5 Hazardous Materials Use and Storage During Construction

Material	Hazardous Characteristics	Purpose	Storage Location	Maximum Stored	Storage Type
Diesel fuel	Ignitability	Refueling construction vehicles and equipment	Equipment Service Area	4,000 gallons	Tank
Diesel fuel	Ignitability	Refueling truck	Equipment Service Area/mobile	1,000 gallons	Truck
Gasoline	Ignitability	Refueling construction vehicles and equipment	Equipment Service Area	1,000 gallons	Tank
Gasoline	Ignitability	Refueling truck	Equipment Service Area/mobile	1,000 gallons	Truck
Acetylene	Ignitability	Welding	Equipment Service Area	500 cubic feet	Cylinders
Oxygen	Ignitability	Welding	Equipment Service Area	500 cubic feet	Cylinders
Lubricating oil	Mildly toxic	Lubricating equipment parts	Equipment Service Area	500 gallons	Tanks
Hydraulic oil	Mildly toxic	Lubricating equipment parts	Equipment Service Area	1,500 gallons	Tanks
Grease	Mildly toxic	Lubricating equipment parts	Equipment Service Area	45 gallons	Drum

Material	Hazardous Characteristics	Purpose	Storage Location	Maximum Stored	Storage Type
Ethylene Glycol	Mildly toxic	Coolant, antifreeze	Equipment Service Area	500 gallons	Tanks
Cleaning chemicals/ detergents	Toxicity, irritant	Periodic cleaning	Equipment Service Area	150 gallons	Drums or small containers

Table 6 Hazardous Materials Use and Storage During Operation

Material	Hazardous Characteristics	Purpose	Storage Location	Maximum Stored	Storage Type
Hydrogen[1]	Ignitability	PCU working fluid	Generated on site in pressure vessel k-bottles mounted on each SunCatcher, and within Stirling Engine	2,760 pounds for a centralized system or 13,392 pounds for a distributed system. Usage of 5,000 cubic feet per day	Pressure vessel on site. 10 cubic feet within each SunCatcher (4,000 SunCatchers) 196 cubic feet in each k-bottle (20 k-bottles)
Acetylene	Ignitability	Welding	Maintenance buildings	1,000 cubic feet	Cylinders
Oxygen	Ignitability	Welding	Maintenance buildings	1,000 cubic feet	Cylinders
Various solvents, detergents, paints, water treatment chemicals and other cleaners	Toxicity	Building maintenance and equipment cleaning	Maintenance buildings	Twelve (12) 55-gallon drums commercial 1-gallon containers	Drums and above-ground containers
Gasoline	Ignitability	Maintenance vehicles	PCU radiator Maintenance buildings	5,000 gallons	Above-ground storage tank

[1] Project Owner has completed an Off-site Consequences Analysis regarding potential impact of worst case release scenario. See Figure 28, Off-site Consequence Analysis included in Section 6, Maps and Drawings.

Material	Hazardous Characteristics	Purpose	Storage Location	Maximum Stored	Storage Type
Diesel fuel	Ignitability	Fire protection water pump Maintenance Vehicles	Fire protection water skid refueling station with containment	100 gallons initial fill 5,000 gallons	Fire protection water skid. Aboveground storage tank (refueling station)
Insulating oil	Mildly toxic	Electrical equipment	Electrical equipment	25,000 gallons initial fill	Equipment transformers and electrical switches
Lubricating oil and grease	Mildly toxic	Stirling engine/dish drives PCU & Misc. PV Tracker parts	Maintenance buildings	6,000 gallons initial fill	Equipment 150-gallon recycle tank, aboveground container
Ethylene glycol	Mildly toxic	PCU radiator coolant, antifreeze	Maintenance buildings	5,000 gallons initial fill	Above-ground containers
Sodium hypochlorite 12.5 percent solution (bleach)	Toxicity	Disinfectant for potable water	Water treatment structure	4 gallons	Above-ground container

1.c.12.4. Disposal Facilities

There are two options for a nearby landfill. The Barstow Sanitary Landfill is located approximately 30 miles from the Project site, approximately three miles outside of the City of Barstow, off of Highway 247. The main roadways for travel from the Project site to the landfill are I-40 and Interstate 15 (I-15). The landfill accepts a maximum of 1,500 tons per day.

An alternative landfill location is the Victorville Sanitary Landfill, located in the City of Victorville. This facility has future plans for 100 feet of vertical expansion over the entire 67-acre landfill footprint. The main roadways for travel from the Project site to the landfill are I-40 and I-15.

AES of Fontana, located at 13579 Whitram Avenue, Fontana, California, has been identified as a business that specializes in transporting, disposing, and recycling of hazardous waste. AES works in accordance with EPA's regulations and either recycles or treats all hazardous waste by distributing different types of materials to appropriate companies in the area. Table 7 below lists the appropriate businesses that address the specific types of hazardous waste.

Table 7 Business Listings of Specific Hazardous Waste Handlers

Hazardous Material Type	AES Distribution List	Contact Information and Location
All fluids and wastes from trucks (motor oil, coolant, hydraulic fluid, etc.)	D-K Environmental Refinery	323-268-3387 Los Angeles, CA

Spent alkaline batteries and spent lamps from lighting fixtures	Lighting Resources, LLC Universal Waste	800-572-9253 Ontario, CA
Absorbent automotive waste (plus contaminated dirt and gravel)	Siemens Carbon Regeneration Facility	866-372-9378 Colorado River Indian Reservation, Near Parker, AZ
Spent lead-acid or nickel-cadmium batteries	Exide Technologies	818-252-2022 Arleta, CA

1.c.13. Fire Protection

1.c.13.1. Fire Hazards. Four types of hazardous, highly flammable, or explosive materials will be used at the Project site during operations: hydrogen gas, oxygen, acetylene welding gases and gasoline fuel. Two other flammable materials that are difficult to ignite will also be used at the site during Project operations: transformer insulating oil and diesel fuel.

The Project site is located in a moderate fire hazard zone, but is outside of regions where the risk of wild land fires is considered significant.

1.c.13.2. Fire Protection and Safety Systems. All Project fire protection and safety systems will be designed in accordance with applicable LORS and to limit personnel injury, property loss, and Project downtime as a result of fire or other event. See Table 8, Fire Protection Systems Design Conditions. The Project will include both portable and fixed fire suppression equipment and systems. Portable fire extinguishers will be located at strategic locations throughout the Project site. The fixed fire protection system for Project in the main services complex will be a traditional wet system design that provides coverage and protection within the occupied facilities and the surrounding outside non-occupied support areas of the main services complex.

The administration, maintenance, and assembly buildings and water treatment structure will be provided with a fire sprinkler system design that includes fire risers with the required fire inspection and testing valves, instrumentation and monitoring. Automatic fire suppression systems will be provided in the control room. The non-occupied support areas, including the vehicle fueling station, will be provided with a standpipe and hose fire protection design. The hydrogen storage area (which is not located in the main services complex) will have a fire suppression system that meets fire protection code.

The systems will be designed in accordance with the following items, as well as compliance requirements listed in Appendix F Conditions of Certification:

- federal, state, and local fire codes, occupational health and safety regulations, and other jurisdictional requirements;
- the California Building Code (CBC);

- National Fire Protection Association (NFPA) standard practices;
- NFPA 13, Standard for the Installation of Sprinkler Systems (2007 Edition);
- NFPA 14, Standard for the Installation of Standpipe and Hose Systems (2007 Edition);
- NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection;
- NFPA 22, Standard for Water Tanks for Private Fire Protection;
- NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances;
- NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems;
- NFPA 30A, Code for Motor Fuel Dispensing Facilities and Repair Garages; and
- NFPA 55, Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks.

All Project personnel will be given fire safety and emergency training, including instructions in fire prevention, the use of portable fire extinguishers and hose stations, and the reporting of fires to the local County Fire District. Project personnel will only attempt to suppress fires in their incipient phase. Fire drills will be conducted at least twice each year for each work area.

The Project site is located within the San Bernardino County Fire District (SBCFD). The Project site would be serviced by:

- The San Bernardino County, North Desert District, Harvard-Station 46 located at 39059 Kathy Lane, Newberry Springs, CA 92365 located approximately 31 miles northwest of the site;
- If the County determines the need, the volunteer Community Facilities District (CFD) Newberry Springs Fire Department located in Newberry Springs, CA approximately 15 miles west of the site could be used; and
- If the County determines the need, the volunteer fire departments located in Yermo and Daggett, CA located 25 miles north and west from the site could be used.

Access to the site for all of these fire departments would be along I-40 at the Hector Road exit north to the main access road and/or the temporary access road at the eastern Project boundary.

The local fire chief will perform a final fire safety inspection upon completion of the construction and, thereafter, will conduct periodic fire safety inspections and training to Project personnel.

Table 8 Fire Protection Systems Design Conditions

Location	Type of System
Buildings	Automatic Clean Agent System per NFPA 2001 for control room, wet/dry/pre-action sprinkler system for administrative areas, maintenance area, assembly bays, and offices. Fire protection water supply will be from the 230,000 gallon storage tank located at the main services complex. The fixed fire systems in the buildings will be provided as required by local jurisdiction or the UBC. Hose stations and portable extinguishers will be provided throughout buildings as required by code. Detection system and fire alarm pull stations will be provided for the control room. Pull stations shall be located in buildings as required by code.
PV modules	The PV modules require no fire protection, are of non-combustible design and require no combustion for the generation of electricity. Maintenance service vehicles will be equipped with appropriate portable fire extinguishers.
SunCatchers	SunCatchers require no fire protection, are of non-combustible design and require no combustion for the generation of electricity. Maintenance service vehicles will be equipped with appropriate portable fire extinguishers.
Water treatment area	An automatic wet pipe sprinkler system, portable "BC" rated fire extinguishers in all areas and hose reel stations with 100-foot hose in the area.
Main services complex	Wet barrel type fire hydrants will be designed, installed and located as per NFPA 24 and as required per local jurisdiction. The location of hydrants will not be more than 300 feet apart in all outside areas as required by code.

1.c.13.3. Fire Protection and Prevention Plan.

Fire protection at the Project site will include measures relating to safeguarding human life, preventing personnel injury, preserving property, and minimizing downtime due to fire or explosion. Fire protection also involves physical arrangements, such as sprinkler systems, water supplies, and fire extinguishers.

Appendix G, Construction Health and Safety Program (CHSP) includes the Emergency Action Plan/Fire Prevention Plan (EAP/FPP) which provides for fire protection practices, including routine inspections of the Calico Solar project by the designated safety representative. The plan requires prompt action to correct situations deemed to be a fire hazard, and it identifies firefighting equipment and systems at the Project site as well as methods to safely store flammable and combustible materials. Project facilities have been designed by a California-registered fire protection engineer and fire protection equipment is installed and maintained in accordance with all applicable NFPA standards and

recommendations (NFPA 1994). A fire reporting protocol (depending on the size of the fire) and an investigation protocol are detailed in the EAP/FPP.

The comprehensive on-site fire protection system and procedures will be designed and implemented to protect both personnel and property. The EAP/FPP also includes: names and/or job titles of personnel responsible for maintaining equipment and accumulation of flammable or combustible material control; procedures in the event of fire; fire alarm and protection equipment; system and equipment maintenance; monthly and annual inspections; firefighting demonstrations; housekeeping practices; and training.

1.c.13.4. Fire Protection Water.

The Project fire protection water system will consist of a water storage tank, an electric fire protection water pump powered by the emergency generator, yard hydrants, fire risers, and fire sprinkler systems within the buildings. The potable and fire flow water will be stored in an aboveground steel tank with supply and fire flow pumps sized to handle the specific demands. The water in the fire flow and potable fire flow tank will be chlorinated and circulated to keep it fresh. The fire distribution system will need to be flushed periodically to keep water fresh and free from algae growth.

The fire-suppression water storage tank will be sized to store the minimum requirement for domestic water and building fire-suppression water. The design of the storage tank piping will prevent the other water needs from drawing down the water in the storage tank to a level below the minimum requirement for the Project's fire-suppression water system. The electric fire protection water pump and controller will be interfaced with the building fire alarms and fire sprinkler systems to run on reduced pressure during fire flow events. An electric-driven fire protection water jockey pump will maintain water pressure in the fire sprinkler system within the Project facilities and support areas. The electric pump will start automatically if the pressure in the fire protection water loop drops below a given set point. Automatic valves will open to draw water from the fire-suppression water storage tank if pressure falls below the lower set point. The fire protection water pump will run until manually stopped. The fire protection water pump will be installed in accordance with NFPA 20.

1.c.13.5. Miscellaneous Fire Safety Items.

Permanently installed fire alarm detection systems will be provided and designed in accordance with the National Electrical Code (NFPA 70) and NFPA 72. Pull stations will be provided as well as audible and visible annunciation throughout the Project facilities in a zone addressable system; the main monitoring consoles will be located in the Project control rooms. Heat and smoke detectors will also be designed into the zone addressable system. A pre-action fire suppression control system will be provided for the control rooms and related information technology equipment support areas.

Portable fire extinguishers (e.g., carbon dioxide and dry-chemical) will be placed throughout the Project buildings and support areas in accordance with the requirements and guidelines of NFPA 10.

The design and construction of all building and support areas will be free of asbestos and will meet all code and risk management requirements for low toxicity and particulate expulsion during combustion. During both construction and operations, Project personnel will coordinate and work closely with the local fire marshal, fire district, and related emergency response agencies regarding operating and emergency response procedures.

1.c.14. Security and Fencing (During Construction and Operations)

Prior to start of construction of each phase of the Project, desert tortoise clearance surveys and translocations will occur and desert tortoise fencing will be installed around the appropriate areas. After the desert tortoise fence is installed, security fencing will be installed around the appropriate portion of the site. See Figure 14, Permanent Fencing included in Section 6, Maps and Drawings.

An on-site security system will be installed as part of construction. Controlled access gates will be maintained at the entrance to the site at Hector Road. Twenty-four hour site security monitoring will be provided in the control room via closed-circuit television and intercom system. Site security monitoring will be able to be displayed on a real-time as well as a recorded basis. Security monitoring cameras and active detection systems will be provided for Project buildings, support areas, and the entire site perimeter. Regular site security vehicular patrols will be conducted to provide additional site security. Twelve-foot treated one-way access roads will be provided to allow for patrolling of the Project site by the security personnel and for maintenance of the perimeter fence.

The construction entrance to the site will be via a gated entrance off of the San Bernardino County-maintained portion of Hector Road. The Project gate will be used for construction-related entry and exit as well as for entry and exit during Project operations. Secondary access for the fire district will be provided on the eastern side of the Project, for both Phase 1 and Phase 2. These access points will be gated with access made available to the fire district and emergency response teams. Entry into the Project site by fire department or emergency units will be handled on a manual override basis by 24-hour security officers stationed at both entrances.

1.c.15. Electrical Components, New Equipment and Existing System Upgrades

The Project includes construction of an on-site substation south of the railroad, which will include transformers, circuit breakers, metering, and other protection required to connect the Project to the SCE Pisgah substation. Detailed information on the electrical equipment is listed in Table 1, Summary of Significant Structures and Equipment, above.

For the PV technology, the DC collection system will be nominally operational at 450 volts DC from 8 Tracker Blocks to the 2 MW inverter pads. The inverters will convert that input to 450 volt, 60 Hz power. The mid-range 2 MW transformers also located on each inverter pad will step the power up to 34.5 kV. From there, the collection system will feed the power to the on-site substation. This mid-range collection system will be routed both underground and on poles as required by site conditions and the final arrangement of the Tracker Blocks and access roads.

For the SunCatchers, Power will be produced at 575 V by the PCU generators. The output from 12 SunCatcher PCU generators will be collected at a local 600 VAC terminal cabinet. Local terminal cabinets will be wired to a 600-VAC, 2,000-A collector switchboard to constitute a complete 60-unit, 1.5 MW solar group. Each local collector switchboard will be connected to the low-voltage side of a 1,750 kVA GSU transformer that steps voltage up to 34.5 kV. GSUs will be connected together at 34.5 kV to create a 9MW group as shown in Figure 15, 9 MW Typical SunCatcher Layout included in Section 6, Maps and Drawings.

See Section 3.1 for a discussion of existing and proposed transmission system.

1.c.16. Interconnection to Electrical Grid

The Project will produce a nominal net output of up to 663.5 MW to supply to the SCE high-voltage system at SCE's existing 230 kV Pisgah substation, which is located east of the Project. An approximately 0.09 mile long 230 kV single-circuit transmission will be used to interconnect the on-site substation to the Pisgah substation. The overhead line will begin at a dead-end structure located at the on-site substation.

One fiber optic cable and a microwave dish and tower will be provided for communications with SCE and the CAISO.

The on-site substation will consist of an open air bus with 34.5 kV collection feeder circuit breakers. Each feeder breaker will be connected to the collection lines. Additional 35 kV circuit breakers will connect to power factor correction capacitor banks located in the on-site substation. The on-site substation will also consist of power transformers rated at 100/133/167 mega volt amperes (MVA) to convert the generation collection voltage from 34.5 kV to the transmission tie voltage of 230 kV. The power transformers will be protected by 230 kV power circuit breakers. Additional on-site substation equipment will include a 34.5 kV power-factor correction capacitor control system designed to meet the power factor and low-voltage ride-through requirements of the LGIA.

1.c.17. Spill Prevention and Containment for Construction and Operation of Facility

Project Owner will employ BMPs to prevent and contain spills that occur during construction and operations.

The most likely cause of an accidental release during construction and operations of the Project would be gasoline or diesel fuel leakage due to a collision or a spill while refueling a generator construction vehicle or maintenance vehicle. A less likely possibility of tank leakage is aging tank material and/or oxidation of the tank structure. Protective measures to be adopted during a gasoline spill include the following:

- Eliminate all sources of ignition in the vicinity of the spill or released vapor;
- If the material is released into the work area, evacuate the area immediately and monitor area with a combustible gas indicator;
- Stop the source of the release if it can be done without risk;

- Contain the release to prevent further contamination of soil, surface water, or groundwater;
- Clean up the spill as soon as possible, observing precautions in exposure controls/personal protection;
- Use appropriate techniques such as applying non-combustible absorbent materials or pumping;
- Ensure that all equipment used when handling the product is grounded;
- Use vapor-suppressing foam to reduce vapors;
- Use clean, non-sparking tools to collect absorbed material;
- Where feasible and appropriate, remove contaminated soil and place contaminated materials in disposable containers and dispose of in a manner consistent with applicable LORS; and
- Report gasoline spills to local authorities as appropriate or required. This material is covered under the EPA-administered Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) Petroleum Exclusion. Therefore, gasoline releases to the environment may not be reportable under CERCLA.

If a hydrogen release were to occur, personnel would be required to evacuate the immediate area, then qualified personnel would, if possible, eliminate any possible sources of ignition, provide necessary ventilation, and shut off the source of hydrogen. Hydrogen poses no adverse effects on the environment; therefore, released hydrogen gas may dissipate into the atmosphere without incident. The risk of fire is minimized because refilling operations occur outdoors, preventing hydrogen from attaining the minimum 4 percent lower explosive limit.

Transformer oil poses a minor risk of accidental spill. The total transformer oil contained in all of the transformers will not exceed 25,000 gallons. Substation transformers will be delivered to the site without the oil. The oil will be inserted into the transformer tanks from delivery tankers on-site. Precautions will be taken during oil transfer to prevent spills. Absorbent materials will be carried on the supply truck for quick response to an inadvertent oil spill. Any soil contaminated by a spill will be removed to an off-site hazardous waste disposal facility. Substation transformer pads will be designed for containment of the transformer oil in the event the tank is breached. During Project operation, samples of transformer oil will be drawn for testing from a test port on each transformer tank approximately every 3 months. Oil will be removed from the tank for maintenance on intervals of 10 to 15 years.

1.c.18. Health and Safety Program

During construction and operations, Project Owner will implement a health and safety program that addresses potential worker hazards present on the Project site. See Table 9 Location of Potential Worker Hazards at Project Site below. The program will satisfy all

applicable LORs. The Project Owner will also ensure continued compliance by updating the appropriate plans and policies.

Table 9 Location of Potential Worker Hazards at Project Site

	Control Room	Maintenance Shop/ Warehouse	On-site Substation	PV Technology	SunCatchers
Flammable Material		X			X
Hazardous Material		X	X		X
High Voltage	X		X	X	X
Noise		X			
Pressurized Cylinders			X		X
Rotating Equipment		X			X
High/Low Temperature					X

To protect the health and safety of workers during construction, the Project Owner (and the construction contractor) will ensure compliance with the Construction Health and Safety Program (CHSP), and all federal, state, and local health standards that pertain to worker health and safety. The Construction Health and Safety Program will meet the California Occupational Safety and Health Administration (Cal-OSHA) Injury and Illness Prevention (IIPP) requirements. The CHSP is included in this document as Appendix G and includes:

- A written Code of Safe Practices for construction;
- A Construction Personal Protective Equipment Program;
- A Construction Exposure Monitoring Program;
- A Construction Injury and Illness Prevention Program;
- A Construction Heat Stress Protection Plan that implements and expands on existing CAL OSHA regulations as found in 8 CCR 3395;
- A Construction Emergency Action Plan; and
- A Construction Fire Prevention Plan.

Employees will be instructed to use the required personal protective equipment (PPE) during construction activities. Required PPE will be approved for use, distinctly marked to facilitate identification, and be used in accordance with the manufacturer's instructions. The PPE will

be of such design, fit, and durability as to provide adequate protection against the hazards for which it is designed. The type of PPE required for each job task will be described in the job safety procedures for that task. The use of PPE for site activities includes, but is not limited to, the items specifically described in Table 10 below will comply with Cal-OSHA requirements. When protective insulating equipment is used, it will comply with the Electrical Safety Codes.

Table 10 Basic Protective Equipment

Body Area	Hazards	Recommended Protection
Eyes/face	Low-velocity flying particles.	Safety glasses with side shields.
	High-velocity chips and sparks.	Impact goggles or safety glasses with full face shield.
	Corrosive liquid splash during transfer.	Splash-proof goggles and face shield.
	Welding – injurious light rays.	Welding hood with appropriate eye filter lenses.
Head/ears	General wear, overhead rigging, material handling, maintenance, and general construction processes.	Hardhat.
	High noise level.	Earplugs or muff.
Respiratory system	Low-hazard inert dusts.	Dust mask.
	Low concentration solvent vapors.	Cartridge-type organic vapor respirator.
	Acid mists.	Cartridge-type acid mist respirator.
	High-concentration dusts or vapors.	Airline respirator.
	Oxygen deficiencies or gases.	Self-contained breathing apparatus.
Hands and arms	Handling rough or sharp objects.	Leather gloves.
	Handling hot objects.	Insulated gloves.
	Using solvents.	Impervious synthetic gloves.

Body Area	Hazards	Recommended Protection
Feet and legs	General wear for light handling.	Safety-toe shoes
	Handling heavy objects.	Metatarsal safety shoes.
	Working with corrosive liquids.	Safety-toe boots.
	Underground work.	Safety-toe synthetic boots.
Trunk and full body	Hot or corrosive liquids.	Synthetic apron.
	Punctures, impact, or cuts.	Canvas or leather kickback apron or metal mesh apron.
	Breaking acid containers.	Full body suit made of appropriate materials.
Fall protection/rescue	Working from elevated structure or platform without standard railings.	Safety belt and lanyard.
	Vessel entry.	Harness and lifeline or wristlets and lifeline.
	Suspended scaffolds.	Lifeline, safety belt/lanyard.

Safety showers and emergency eye wash stations will be provided at all project buildings and support areas that store or use chemicals, including the assembly and maintenance buildings, the water treatment structure, the vehicle fueling area, and the hydrogen storage area. A first aid station, complete with all emergency medical supplies, will be provided in the operation and administration building near the break room. Also, all Project construction and operation and maintenance vehicles will be equipped with first aid kits and two-way radios.

In addition to incorporating various safety and environmental features and design measures to minimize emergencies and their effects on public and worker safety, the CHSP also includes a site-specific EAP/FPP, as discussed in Section 1.c.13.3.

1.d. Alternatives Considered by Applicant

1.d.1. Alternative Project Site Location Considerations

The characteristics of solar technology dictate that the following considerations must be taken into account when siting utility-scale solar projects:

- Site must have slopes of generally less than 5%;
- Site must have a minimum solar insolation level threshold of 6.5 kWh/m2/day;

- Site must comprise at least 2,500 acres;
- Site must be located near existing transmission or designated transmission corridors;
- Site must be located near existing roads;
- Site should not include lands designated as critical habitat for listed species, in areas designated Areas of Critical Environmental Concern, or designated high recreational use areas;
- Site should not be subject to land use designations that prohibit solar development or be classified as an area inappropriate for utility-scale solar development; and
- Site must be available for development of a utility-scale solar plant.

1.d.2. Alternative Technology Considerations

There are a number of solar technologies available today, most of which fall into two general categories, concentrating solar power and photovoltaic. The following considerations are most relevant in evaluating the technological and economic feasibility of a utility-scale solar project as well as evaluation of potential environmental impacts associated with development and operation of such a facility:

- The cost of developing utility-scale project with selected technology;
- The availability of necessary component parts;
- The technology's land use efficiency (i.e., the amount of land required to generate 1 MW of power);
- The required construction techniques and installation processes, including site preparation, assembly and testing;
- The operation and maintenance requirements;
- The amount of water required during construction and operation; and
- The type and quality of process chemical and/or the hazardous materials required or generated.

1.d.3. Alternative Project Design/Layout/Phased Development Considerations

Project design and layout are largely driven by the need to maximize the energy output as economically as possible while, at the same time, minimizing environmental impacts. The ability to accomplish these goals is dictated by the following considerations for each major component of the Project:

- PV Components - The basic building block of the PV technology are Tracker Blocks. To be economically viable, the site layout must allow for a standardized configuration of most of the PV Tracker Blocks on the site as well as placement of the related

inverter pads within the Tracker Blocks. While small variations in the configurations are possible, significant deviation will compromise the viability of the Project.

- SunCatcher Components - The SunCatchers are placed in 1.5 MW groups comprised of 60 individual SunCatchers. The standard configuration of a 60 SunCatcher group is on a grid, with the SunCatchers spaced far enough part to avoid shadowing of one SunCatcher by an adjacent SunCatcher. The SunCatchers must also be placed so that every other row is accessible by vehicles, allowing for mirror washing and maintenance during operation. Like the PV portion of the site, some deviation in the configuration of a 60 SunCatcher group is possible, but the majority must be in a standard configuration to allow for an economically viable project.

- Main Services Complex - The main service complex must be located within Phase 1 of the Project as it must be operational prior to generation and delivery of electricity from the Project site. It must be centrally located to allow for efficient operation and to minimize environmental impacts.

- Substation - The on-site substation must be located in Phase 1 of the Project. The number of transmission towers will depend on the location of the on-site substation in relation to the Pisgah substation.

- Roadways - The main access road must allow for efficient access to the main services complex and the solar field. Maintenance roads must be placed so as allow access to and maintenance of the solar field. A perimeter road is necessary for access around the Project site.

The phasing of the Project is dictated by the need to generate renewable energy for the grid as soon as possible. Phase 1 of the Project includes 275 MW, the amount of energy that can be delivered to the grid without major upgrades to the SCE transmission system. Phase 2 will include 388.5 MW, which can only become operational following completion of SCE planned transmission system upgrades. See Section 3.

Phase 1 of the Project will be located primarily south of the railroad, in the area that includes lower quality desert tortoise habitat and has been shown by past surveys to be occupied by a low number of desert tortoises. By limiting construction in Phase 1 primarily to these areas, the Project will be able to develop additional information related to desert tortoise translocation prior to undertaking translocation of the vast majority of desert tortoise anticipated to be on the project site. Locating Phase 1 south of the railroad also minimizes the amount of traffic that will need to cross the railroad prior to installation of the permanent above-grade crossing.

1.d.4. Alternatives Considered But Not Carried Forward

During review and approval of the Project, the BLM and the CEC and Calico Solar considered a range of alternative sites, technologies and project configurations. Seven alternative sites were considered but eliminated from further review because: (1) they would not substantially reduce impacts of the Project; (2) they are designated as critical habitat or included in the Upper Johnson Valley OHV Area; (3) development of the Project would be inconsistent with existing BLM land management policies; and/or (4) there are pending applications for development and therefore such lands are not considered available for development of the Project. Appendix H, Applicant's Submittal of Additional Alternatives Analysis. Additionally, one private land alternative site was identified, but eliminated from further consideration, because it would not meet the purpose and need of the Project. The alternative was also determined to be impracticable and uneconomical as it was comprised of over 100 parcels owned by 49 separate land owners. For further information regarding the alternative sites considered, see Table 2-1 in the Calico Solar Final Environmental Impact Statement, (pp. 2-49 to 2-51).

The BLM and CEC also evaluated 14 alternative technologies, including solar technologies, other renewable energy technologies and nonrenewable energy technologies. Each of these was eliminated from further review as it was determined that use of these technologies in the Project would not reduce environmental impacts and/or was not technical or economically feasible on the Project site (Calico Solar Final Environmental Impact Statement, Table 2-1, pp. 2-51 to 2-55). It should be noted that in the Calico Solar Final Environmental Impact Statement, the BLM eliminated from further consideration the use of PV technology in place of the then proposed SunCatcher technology based on a determination that installation of PV technology would have a greater impact on biological and cultural resources as it would require grading of the entire site. As described above, the Project will use both PV technology and SunCatcher technology. Installation of both technologies will be accomplished without large-scale grading on the site.

1.d.5. Comparative Analysis of Alternatives

Two alternatives have been subject to detailed analysis. The first involves reducing the Project to a 275 MW facility. This alternative would proportionally reduce environmental impacts. It is not environmentally preferable, however, because it would also substantially reduce the amount of renewable energy generated on federal land and the ability to accomplish the identified project purpose and fulfill the project need (see Section 1.b above).

The second alternative analyzed is the No Action Alternative. Under this alternative, the BLM would not approve development of the Project. While this alternative would eliminate all of the Project's environmental impacts, it would also eliminate the ability to meet the identified purpose and need of the Project. Further, because CDCA Plan allows for development of utility scale solar projects on the site, it is likely that the BLM would receive another application for development of the site. An alterative project located on the site would be likely to have similar impacts as the Project. Therefore, the No Action Alternative is not environmentally preferable.

1.e. Other Federal, State and Local Agency Permit Requirements

Table 11 below lists the fundamental permits required for this project. A list of additional permits required for the Project is also included as Appendix I, Developer Permits.

Table 11 Applicable Permits

Responsible Agency	Permit/Approval	Status
Federal	BLM - Right-of-Way Lease/Grant	Granted 10/21/2010
Federal	BLM - Amendment of Right-of-Way Lease/Grant	Pending
State	CEC- Certificate	Granted 12/1/2010
State	CEC - Petition to Amend	Submitted 3/18/2011

Included as well is Appendix J, Department of Army Permit Determination Letter indicating that the Project does not contain waters of the United States and therefore a Clean Water Act Section 404 permit is not required.

1.f. Financial and Technical Capability of the Project Owner

Calico Solar is a wholly owned subsidiary of K Road Power Holdings LLC ("K Road"). On December 24, 2010, K Road acquired Calico Solar from Tessera Solar, Calico Solar's prior owner. K Road and its principals have a long history of successfully developing and safely operating over 15,000 MW of conventional and renewable power assets, creating exceptional value for shareholders and stakeholders. K Road's philosophy and approach to development, construction, financing and operation of power projects is to retain the services of consultants, financial advisors, engineers, attorneys, environmental specialists, EPC contractors and others as needed on a project-by-project basis to supplement its own expertise.

Calico Solar's management team has developed, owned, constructed and operated dozens of power plants of virtually every technology – natural gas, hydroelectric, oil, coal, biomass, and solar. This team includes management, technical and operating specialists who have unparalleled experience with a wide variety of power generation technologies. They have developed and operated plants utilizing the following fuels: hydro, solar, natural gas, light distillate and heavy oil, coal, and waste wood. Additionally, their portfolio included twelve hydroelectric plants. This team specializes in adapting generation technology to fit the operating, geographic and financing environment of its projects. For the Project Site, Calico Solar's management team has decided to include PV technology, a commercially viable technology that is currently available, with the approved SunCatcher technology to bring 663.5 MW of power on-line to service California's renewable energy demand.

For the permanent financing needs of the Project, Calico Solar intends to seek debt and equity capital. Equity capital will come from the shareholders and outside investors. Debt capital will be raised through commercial banks and investment banks. Calico Solar's management team has significant experience raising single and multiple project debt and equity financings for over 59 generating facilities in both the public and private markets. Additionally, this management team has deep experience in successfully financing projects using structured power and renewable energy sales arrangements.

2. CONSTRUCTION OF FACILITIES

2.a. Solar Field Design, Layout, Installation and Construction Processes Including Timetable and Sequence of Construction

The site plan for the Project is shown on Figure 16, Site Layout included in Section 6, Maps and Drawings. The Project consists of a combination of PV technology and the SunCatcher technology to achieve 663.5 MW output for the Project. Approximately 2,140 PV Tracker Blocks will produce a total of 563 MW and approximately 4,020 SunCatchers will produce 100.5 MW.

PV Tracker Blocks are the basic building blocks of the PV arrays. Each basic Tracker Block will be similar in configuration and capability. A basic Tracker Block measures about 280 feet by 180 feet and occupy a space of about 1.1 acres. See Figure 17 Typical PV Module Tracker Block below. Tracker Blocks may be reconfigured as required by site characteristics such as boundaries, roads, topography or similar constraints.

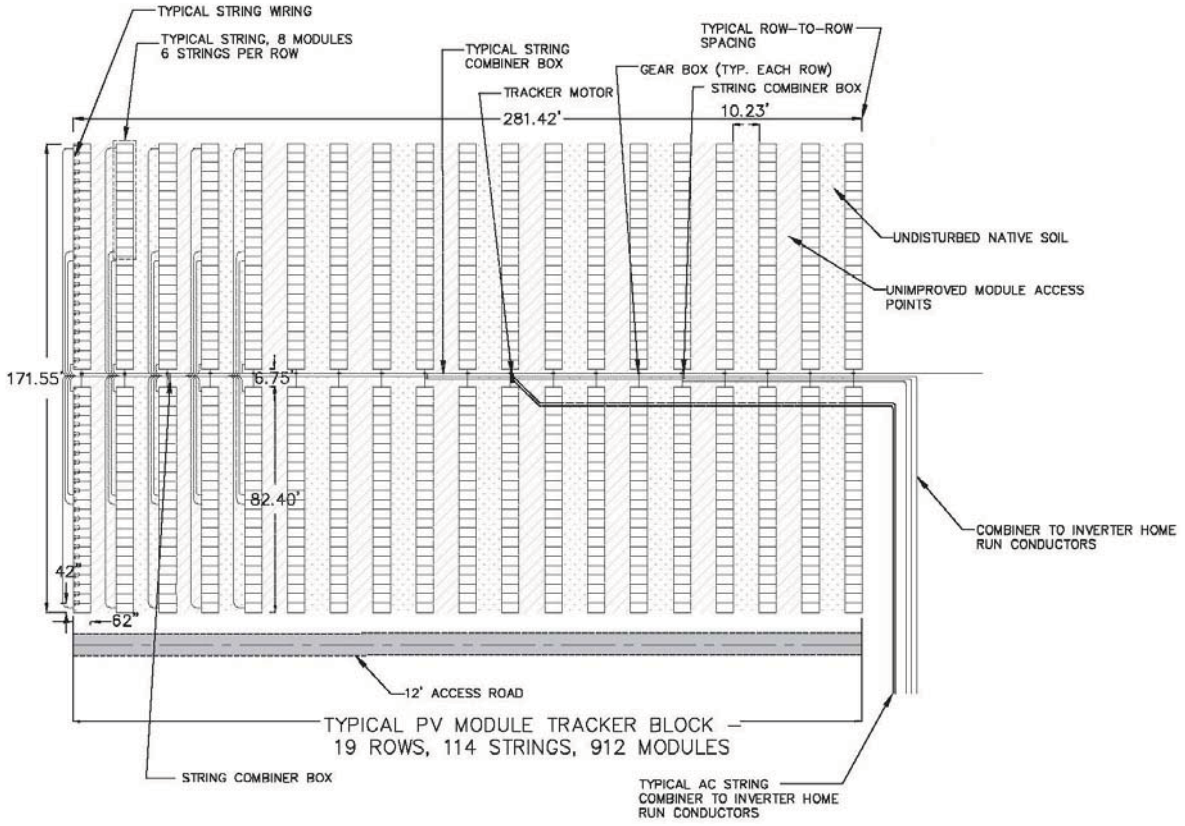

Figure 17 Typical PV Module Tracker Block

The energy produced by each of the Tracker Blocks is directed to one of the 2 MW inverter pads, which will contain two or more inverters and a 450 volt to 34.5 kV transformer. Each inverter pad is generally centralized and services eight Tracker Blocks.

The basic building block for the SunCatcher is a 1.5 MW solar group consisting of 60 SunCatchers. SunCatcher groups are generally constructed on a grid, but layout may vary

as required by site characteristics such as boundaries, roads, topography or similar constraints. The 1.5 MW groups will be connected into 9 MW solar groups. A typical 9MW group is shown on Figure 15, 9 MW Typical SunCatcher Layout.

The Project's main services complex is centrally located within Phase 1, south of the railroad. A maintenance building, an administration building, two assembly buildings, water tanks, evaporation bonds and the 10-acre temporary construction laydown yard are located in the main services complex. See Figure 13, Calico Solar Main Services Complex. The on-site substation is also located south of the railroad and adjacent to SCE's Pisgah substation.

The main entry and exit to the Project will be from Hector Road off of Interstate 40. The Project has one main access road and several accesses roads. See Section 2.c, Access and Transport, for further discussion of the Project's roads.

Installation and construction processes are discussed in Section 2.e through 2.k. Included in this document for reference is Appendix K, Calico Integrated Schedule. This includes a detailed timetable for the remaining permitting and design activities, as well as the sequence of construction.

2.b. Approach to Construction and Operations

Construction of the Project will occur in two phases. Phase 1 of the Project will be located primarily south of the railroad and will include the main access road, the main services complex, the on-site substation and a portion of the PV modules. The well and a portion of the waterline will be constructed north of the railroad in Phase 1. Phase 2 of the Project will be located north of the railroad and will include the remainder of the PV modules and the SunCatchers, as well as the hydrogen-related infrastructure. The SunCatchers will be located toward the center of Phase 2. Additional information on construction and the phased approach is provided in Section 3 of this document. Additional information on operations is provided in Section 4 of this document.

2.b.1. PV Single-Axis Tracking Solar Array

The PV arrays are installed in a block configuration consisting of eight Tracker blocks. Each Tracker block produces 250 kW of power and is comprised of nineteen rows. A typical row consists of 48 PV modules attached to a horizontal steel shaft. These shafts are supported by 4.5-inch-diameter vertical steel posts that are spaced approximately 12 to 15 feet apart. The steel shafts are connected by a main drive shaft, which is supported by 6-inch-diameter steel posts. Both the 4.5-inch and the 6-inch steel posts generally project 5 to 6 feet above the ground and are vibrated to a roughly equivalent depth into the ground. To account for minor ground surface differences, instead of grading, the steel posts would vary in height above the ground surface more than the 5 to 6 feet mentioned above in order to create a level Tracker Block. At maximum tilt, the modules will be at least 3 feet from the ground surface as well as 3 feet above the shaft, for a total height of approximately 9 feet. See Figure 18, Typical PV Module Installation Detail below. The site has very favorable soils conditions and allows all foundation posts to be hydraulically vibrated into the ground. There will not be a need for the use of any concrete or cementing material for the PV foundation post installations.

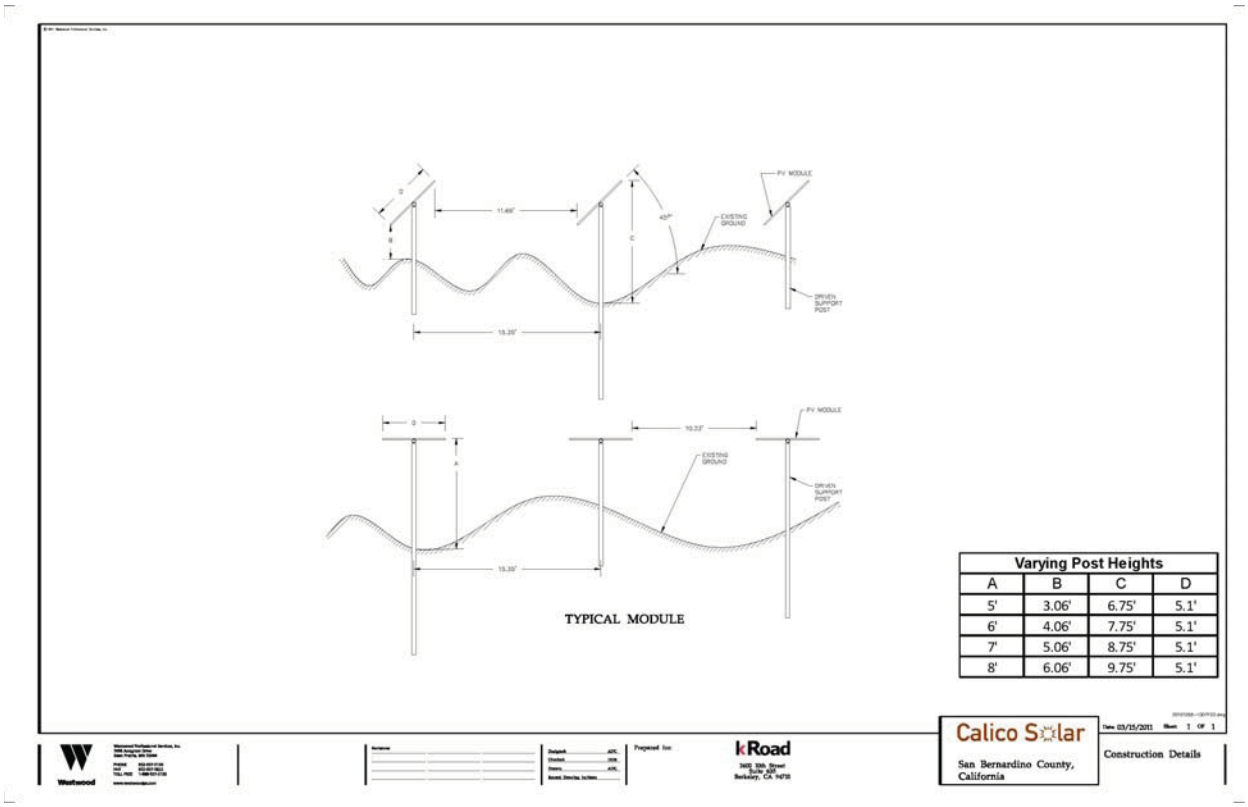

Figure 18 Typical PV Module Installation Detail

The configuration of the Tracker Blocks creates open areas between rows. Alternating open areas will be designated as unimproved module access points allowing occasional access up to four times per year for module washing and maintenance activities. Natural vegetation will be allowed to grow in the open areas not used as access points and these areas will remain undisturbed.

The energy produced by each Tracker Block is directed to one of the approximately 282 inverter pads. Each 2 MW inverter pad is approximately 33.5 feet by 15 feet and will contain two or more inverters, one step-up 450 volt to 34.5 kV transformer, and one main line distribution switchboard mounted on a foundation. As a result of the recent increases in the size of PV projects, inverter suppliers are actively developing larger units to allow fewer inverters per MW. The inverter pads have been selected to take advantage of this trend. The inverters not only convert the DC energy from the modules to 60 Hz but they also provide the power quality functions of voltage regulation, power factor control, low-voltage ride through (LVRT), and supervisory control function, in accordance with SCE system and CAISO requirements. From the inverter pads, the electricity runs through underground wires and on posts to the on-site substation where it is stepped up to the 230 kV required for the SCE interconnection.

2.b.2. SunCatcher Array

Each SunCatcher consists of a PCU and a mirrored-surface dish assembly operating as a solar concentrator that automatically tracks the sun.

The solar dish is typically mounted on a foundation consisting of a metal pipe that is hydraulically driven into the ground. This foundation is preferred because no concrete is required, no spoils are generated, and the foundations can be completely removed when the project is decommissioned. The metal pipe foundation creates minimal disturbance to the environment. The SunCatcher pedestal on which the SunCatcher dish assembly is secured is approximately 18 feet 6 inches in height and will be an integrated part of the metal pipe foundation or will be a separate structure fastened to the rebar-reinforced concrete foundation at ground level.

SunCatcher Dish Being Lowered Onto Pedestal

The dish assembly collects and focuses solar energy onto the PCU to generate electricity. Each PCU consists of a solar receiver heat exchanger and a closed-cycle, high-efficiency Solar Stirling Engine specifically designed to convert solar power to rotary power via a thermal conversion process. The engine drives an electrical generator to produce electricity. Power generated by each 1.5 MW group of 60 SunCatchers is collected through a 600-volt power collection system. This collection system combines the output from the units and connects each 1.5 MW group to a generator step-up unit (GSU) transformer with an output voltage of 34.5 kilovolt (kV). This is repeated until the full project electrical size is reached.

The design and modularity of the SunCatcher allows for significant flexibility in specific site usage and design. Each site is constructed using three basic building blocks; the dish, 1.5 MW group, then scaling up to 9 MW groups. Power will be placed on the grid at completion of each 9 MW block. This allows power production and earning of revenue earlier in the process than a solar facility using non-modular technology. See Figure 19, Typical SunCatcher Layout below.

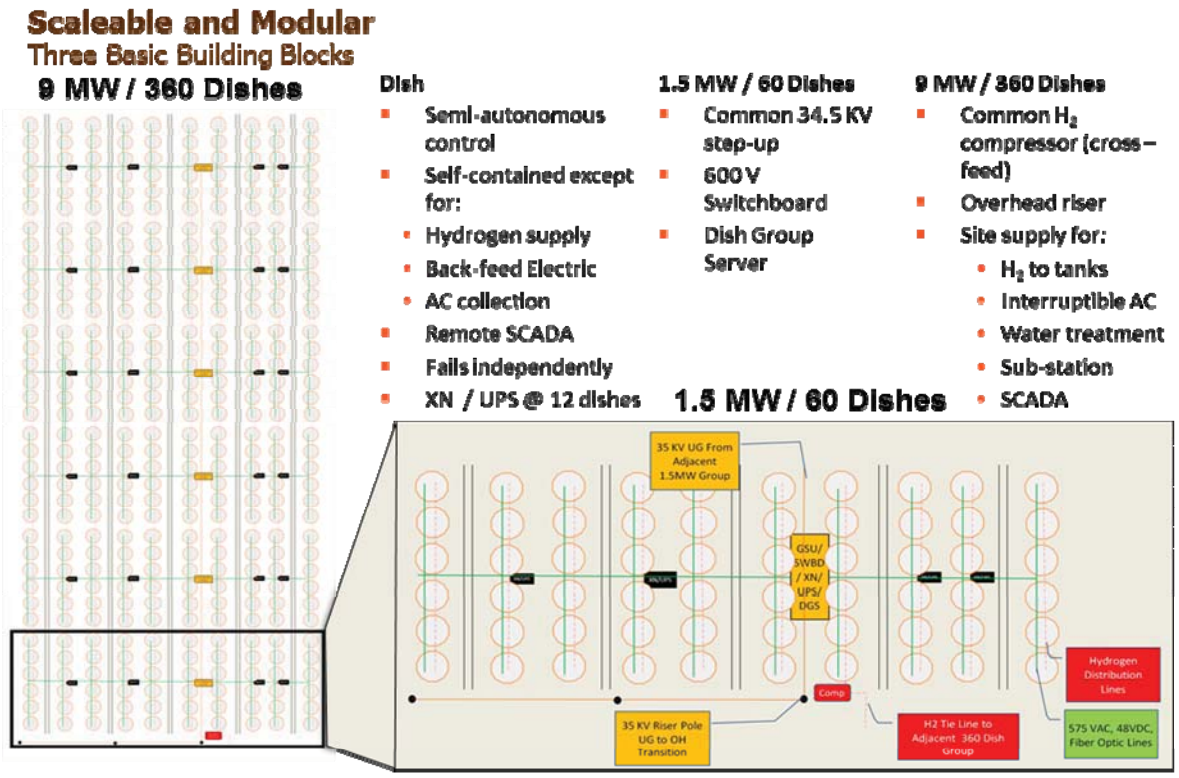

Figure 19 Typical SunCatcher Layout

2.c. Access and Transportation System, Component Delivery, Worker Access

The main access for employee and general construction traffic to the Project site during construction will be from I-40 using the Hector Road exit. Phase 1 traffic will continue northward on the 0.2 miles of county-designated Hector Road. Traffic will then turn onto the Project site, on the south side of the railroad, and continue east on the main access road to the main services complex where all project materials and equipment will be staged and stored for later use. This main access road will also be the primary route for workers to reach the main services complex as well as for deliveries of supplies and equipment during construction and operations. Parking for 125 vehicles will be located at the main services complex. Prior to the commencement of activities north of the railroad, the Project Owner will negotiate a temporary right-of way access to the north side of the railroad to conduct periodic engineering surveys and well water line installation, among other activities. This temporary right of way will also allow the EPC contractor to access the north side of the railroad to install the permanent grade-separated bridge crossing at the beginning of Phase 2. Upon completion of the bridge construction, the main access road installed south of the railroad will be extended northeast to allow access to all of Phase 2, including the proposed SunCatcher area. Intermediate smaller roads will be installed throughout the site to provide access throughout the site for construction and other project activities. Access to the Project site will be through controlled gates. See Figure 20, Existing Project Vicinity Access Routes and Figure 21, Proposed Post Project Development Access Routes, included in Section 6, Maps and Drawings.

The paved main access road will be 24-feet wide (one 12-foot lane in each direction). The surface treated access roads/interior perimeter access roads will be designed with one 12-foot lane. These roadways will allow for a looped access to the main services complex, the PV solar field, and access to the electrical substation. SunCatcher maintenance roads will be one 8-foot lane, surface treated with a suitable non-toxic soil stabilizer. Secondary site access roads will be 20-feet wide (one 10-foot lane in each direction) and stabilized using a non-toxic soil stabilizer.

As indicated in Figure 21, Proposed Post Project Development Access Routes, the Project Owner will provide an access route around the Project perimeter via an exterior perimeter roadway consisting of a single 8-foot lane to allow local land owners and the general public access to the areas north and east of the site. Designated routes within the immediate Project vicinity are set forth in Table 12, Designated Routes below and further detailed in Appendix L, Draft Traffic Control Plan.

Table 12 Designated Routes

Road ID	Length Inside of Project Boundary	Current Classification	Proposed Classification
UNK	0.55 Miles	Unspecified	Closed
AF045	2.4 Miles	Open	Closed
AF0450	2.13 Miles	Open	Closed
AF058	3.6 Miles	Open	Closed
AF133	0.26 Miles	Open	Closed
AF132	0.001 Miles	Open	Closed
AF052	2.17 Miles	Open	Closed
AF053	0.52 Miles	Open	Closed
AF298	4.68 Miles	Open	Closed

Construction traffic is expected to commence in the fourth quarter of 2011 and continue through the construction schedule. Traffic should peak during the first two quarters of 2012.

During construction, it is anticipated that specialized trades and higher-skill-level construction personnel will commute to the Project site on a weekly basis and stay in temporary housing or apartments during the week for the duration of the construction phase. Similarly, contractor or subcontractor employees will commute on a weekly basis and lease temporary housing or apartments in the Barstow area. The construction employee commutes will depend on the competitive bid selection of contractors and subcontractors and travel

distance from their offices. The existing park and ride located in Barstow may be used by Project personnel.

2.d. Construction Work Force Numbers, Vehicles, Equipment, Timeframes

The Project Owner will endeavor to employ qualified subcontractors and construction personnel from the local area. Bid solicitations will be made through plan centers and trade publications that serve a 200-mile radius from the site and beyond. It is expected that 90 percent of the workforce will reside in Southern California, including the Barstow area. The remainder may come from other areas of the southwest. Many of the higher-skill-level positions required for essential trades, such as high-voltage line electricians, controls and information technology specialists, and engineers, could come from outside the local area.

Construction trade personnel can be found by working with several resources in the County of San Bernardino. The Economic Development Department (EDD) administers programs to assist employers who locate in the County; the Workforce Development Department is a division of the EDD which operates and administers programs under the Department of Labor's Workforce Investment Act. In addition, the Workforce Investment Board can assist in finding a workforce that possesses the necessary skills. Finally, the Inland Empire Economic Partnership also can provide a mechanism for access to workforce information, hiring and training.

The size of the on-site workforce will average 340 employees per month, with as many as 400 to 700 employees on-site during peak periods of construction activity. During construction, the average salary range per employee is expected to be approximately $20 to $60 per hour, including benefits.

The Project Owner will encourage the use of car pooling to minimize worker vehicle traffic. Other Project vehicles will include standard freight trucks for deliveries, water trucks, and on-site construction related equipment needed to support the various project tasks. Most equipment used during construction will remain on-site until no longer required. Therefore, vehicle traffic related to construction equipment will be greatest at the beginning and end of the Project. The majority of non-worker vehicle traffic will be associated with the delivery of solar generating equipment and components. These deliveries will primarily be directed to the main services complex where equipment and components will be unloaded, stored and staged for distribution on the site. Forklifts and flat bed trucks will distribute equipment and components to the appropriate installation locations on site.

Table 13 Construction Trip Generation summarizes the estimated construction traffic.

Table 13 Construction Trip Generation

Vehicle Type	Peak Daily Trips	Morning Peak Trips			Evening Peak Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Construction worker vehicles[1]	714	357	0	357	0	357	357

Vehicle Type	Peak Daily Trips	Morning Peak Trips			Evening Peak Trips		
		Inbound	Outbound	Total	Inbound	Outbound	Total
Truck deliveries[2]	108	54	0	54	0	54	54
Total Trips	822	411	0	411	0	411	411

[1] Peak workforce was analyzed at 357 (Month 13) worker trips, it was conservatively assumed each driver traveled alone during both the morning (0700 to 0900) and evening (1600 to 1800) peak hours.

[2] Truck deliveries (Month 13) were adjusted into Passenger Car Equivalent (3 PCE) vehicles (18 Delivery vehicles x 3 PCE = 54 one-way or 108 round trips). Delivery trips were conservatively assumed to occur during both the morning inbound (0700 to 0900) and evening outbound (1600 to 1800) peak hours.

2.e. Site Preparation, Surveying and Staking and Site Surveys

A detailed land survey was performed to establish local benchmarks and Project site boundaries. A topographic survey was performed to assist the engineering effort to establish the site's grading and drainage plans for the PV technology and SunCatchers, roadways, and other project features. A geotechnical investigation was performed (see Appendix A, Geotechnical Engineering Report) to evaluate general surface conditions, basic subsurface conditions, seismicity, and the other geological information necessary to develop recommendations for the design and construction of foundations, aboveground structures, and equipment. A Record of Survey is underway and will be submitted to BLM, upon completion.

The Project physical boundaries and internal feature footprints will be properly staked by a licensed survey team to delineate all Project features. The staking activities will also identify and delineate all the environmental sensitive areas and outline the areas where desert tortoise fencing will be installed.

Prior to the start of ground disturbing activities, the contractor will verify utility locations as required by LORS and general practice. The Project has been designed to avoid all ground penetrating activities within the known existing utility corridors. A few roads will cross the existing utility corridors. Prior to work directly impacting a utility corridor, the affected utility will be given copies of the construction plans in the area of their utilities and will be notified of the schedule of work in sufficient time to allow for the observation of construction activities.

2.f. Site Preparation, Vegetation Removal and Treatment

Site preparation will include vegetation trimming (discussed in Section 1.c.11) limited grading, soil compaction and soil stabilization. The Project Owner will implement BMPs to minimize the total area disturbed and/or treated. Vegetation will only be removed in permanently disturbed areas.

Non-paved access roads will be treated with a non-toxic soil stabilizer to provide dust control measures. All site preparation, vegetation removal and treatment will be performed in accordance with all applicable LORS and as indicated throughout this document.

2.g. Site Clearing, Grading and Excavation

2.g.1. Site Clearance and Grading

Minimal grading will be required for the installation of the PV technology and SunCatcher systems. The PV Tracker Block posts and the SunCatcher pedestals will be hydraulically vibrated into the ground. Grading will be reduced by overcoming varying elevation changes with using adjustable post and pedestal heights.

After brush is trimmed on the SunCatcher portion of the site, blading for roadways and foundations would be conducted between alternating rows to provide access to individual SunCatchers. Blading would consist of limited removal of terrain undulations. Although ground disturbance would be minimized wherever possible, the Project Owner would remove localized rises or depressions within the individual 1.5 MW solar groups to provide for proper alignment and operation of the individual SunCatchers.

The majority of grading activities will be associated with the main access road, bridge construction, facility substation and building foundations. The Project Owner will maintain a balance of the material excavated (cut) on the site and used as fill. The Project Owner will minimize the need for import or export of soils.

Surface-treated roadways will be constructed as close to the existing topography as possible, with only limited cut-and-fill operations as necessary to maintain roadway design slope to within a maximum of 10 percent. It is anticipated that roadway maintenance may be required after rainfall events. Unpaved roadway sections may need to be repaired and bladed to remove soil deposition during storm events.

2.g.2. Site Drainage

The Project Owner will maintain the local predevelopment drainage patterns and will provide measures to allow natural storm water flows to remain the same where feasible. Retention basins and/or diversion channels will be implemented where required to assist in allowing the natural storm water to remain consistent with existing pattern flows. The paved roadways will have a low-flow, unpaved swale or roadway dip as needed to convey nuisance runoff to existing drainage channels. It is expected that storm water runoff would flow over the crown of the paved roadways, which are typically less than 6 inches from swale flow line to crown at the centerline of the roadway, thus maintaining existing local drainage patterns during storms. The Project will use low-flow culverts on emergency access routes and all other roads would be at grade.

Arizona Crossings (roadway dips) would be placed along the roadways, as needed, to cross the minor or major channels/swales. These designs would be based on BMPs for erosion and sediment control. Arizona Crossings would also be used for major washes where the channel cross section exceeds 8 feet in width and 3 feet in depth or exceeds 20 feet in width and 2 feet in depth. The roadway section at the channel flow line would be without a crown. See Figure 22, Arizona Crossing.

The Project includes localized channel grading on a limited basis to improve channel hydraulics within the dry washes and to control flow direction where buildings and roadways

are proposed. Rainfall from treated areas and building roofs will be collected and directed to the stormwater retention basins. Retention basins will be sized based on storing the volumes expected for the 100-year, 24-hour storm volumes. The retention basins will also be designed to maintain the pre-development runoff flows as well as sediment transport rates. The retention basins will be designed so that the retained flows will empty within 72 hours after the storm to provide mosquito abatement. This design can be accomplished by draining, evaporation, infiltration, or a combination thereof. The main services complex would be protected from a 100-year flood by berms or channels that would direct the flow around the perimeter of the building site, if required.

2.h. Solar Array Assembly and Construction

The Project utilizes two technologies to generate power, PV Tracker Blocks and SunCatcher groups.

Prior to installation of the PV modules, the 4.5-inch and the 6-inch supporting steel posts are vibrated to a depth of 5 to 6 feet into the ground. The posts generally project 5 to 6 feet above the ground. To account for minor ground surface differences, instead of grading, the steel posts would vary in height above the ground surface more than the 5 to 6 feet mentioned above in order to create a level Tracker Block. The PV modules are then mounted by hand on the steel posts and, thereafter, all necessary electrical, communications and other connections would be made. The PV technology does not require any significant pre-assembly prior to erection in the field.

The SunCatcher units are approximately forty feet in height and thirty-eight feet wide in diameter. The size of the SunCatcher unit requires special pre-assembly operations in a controlled environment onsite, as well as special material handling equipment such as cranes in the field during erection activities. SunCatcher assembly would be performed in temporary assembly buildings located at the main services complex. The major components of the SunCatchers would be assembled in these buildings, including the superstructure, the main beam assembly and trusses, the pedestal trunnion, mirrors, wire harnesses, control systems, drive position motors and the calibration of the mirrors and control systems prior to field installation. Once assembled, SunCatchers would be transported to the location on the Project site where they will be erected via crane, and attached to a pedestal that has been vibrated into the ground. Thereafter, all necessary electrical, communications and other connections would be made to the SunCatcher.

2.i. Power Plant Construction

The Project will be developed in two phases. Phase 1 will be located primarily south of the railroad and will comprise of 275 MW of PV module and Tracker blocks. Phase 2 will be located north of the railroad and will be comprised of 288 MW of PV Tracker Blocks with 100.5 MW of SunCatcher technology. The schedule will be approximately 48 months in duration, with approximately 24 months dedicated to each phase of construction. One main services complex with associated support buildings and service facilities will be installed in Phase 1 and will provide the necessary infrastructure to support the entire 663.5 MW plant. One on-site substation will be installed during Phase 1 as well and will accommodate all the necessary electrical infrastructure, including transformers, switch gear, and safety devices to accept all distributed project power and transfer that power to the SCE Pisgah substation. All

project construction activities and structures including buildings, solar generating system installation, field electrical connection and distribution and main sub-station infrastructure will be designed and installed in accordance with all applicable LORS.

Major construction milestones are identified in Appendix K, Calico Integrated Schedule.

2.j. Gravel, Aggregate, Concrete Needs and Sources

The Project expects to utilize as much on-site natural soils and gravel as possible in order to minimize the need to source materials from off-site locations. The majority of gravel and aggregate obtained from on-site excavation activities will be used in the construction of the main access road and all secondary roads. There may be a limited need for some off-site materials if required by approved engineering specifications. All materials will be placed, layered, distributed, and compacted within the strict guidelines of the engineering specifications and applicable LORS. Concrete is not an essential component of the solar generating system design due to the ability to hydraulically vibrate all PV posts and SunCatcher pedestals into the ground. It is anticipated that the majority of Project's "wet" concrete applications will be for structural foundations. All concrete material and the associated procedures of its use will conform to applicable quality design standards as outlined in the approved engineering specifications and LORS.

The main site access road will be paved using traditional bituminous concrete (asphalt) materials. All other secondary access roads will use a combination of hard-packed gravel and non-toxic soil stabilizers for design of construction.

In order to access Phase 2 of the Project site, a permanent grade-separated bridge crossing will be constructed to span the railroad. The bridge approach is anticipated to be placed on BLM land where the railroad right-of-way is at 200-feet in width (approximately 1.5 miles east of the existing temporary crossing at the I-40 Hector Road exit). The proposed bridge will be designed with a 220-foot long, 125-foot clear span, and 36-foot wide PC/PS girder bridge carrying two 12-foot lanes of traffic and a 4-foot shoulder on each side per BNSF Clearances for Highway and Pedestrian Overpass. The permanent main access road will be the primary operations and maintenance roadway for the Project site.

Gravel, aggregate and concrete needs are further discussed in the ancillary facilities discussion in Section 1.c. Generating Facility Description, Design and Operation of this document. These materials will be locally sourced using on-site materials where practical and off-site materials where required by the approved engineering drawings.

2.k. Electrical Construction Activities

Power generated by PV modules and SunCatcher groups will be collected through a power collection system. This collection system will combine the output from the PV modules for transmission to the on-site substation and also combine the output from the SunCatchers for transmission to the on-site substation. Inside the on-site substation, 34.5 kV power from the collection system will be stepped-up to 230 kV for interconnection to SCE's Pisgah substation.

All intra-system wiring within individual power blocks, whether PV Tracker Blocks or SunCatcher groups, will be a combination of above ground and below ground wring, depending on the design requirements for each individual block or unit location. Licensed electricians with the assistance of general labor will be responsible for the proper installation and connection of all electrical wiring and safety devices throughout the entire network of power generation, collection and distribution. All on-site substation electrical activities will also be conducted by licensed electrical contractors and will conform to all applicable approved engineering specifications and LORS.

An off-site single-circuit generation interconnection transmission line will be constructed a distance of approximately 0.09 miles to connect the Project to the SCE Pisgah Substation. Through this transmission interconnection, the Project will transmit a nominal net output of up to 663.5 MW to the SCE high voltage system at the SCE Pisgah Substation located adjacent to the Project. At the on-site substation, one (1) 220 kV main circuit breaker will connect to the 220 kV transmission circuit on a 220 kV single-circuit transmission line to the SCE Pisgah Substation. One fiber optic cable and a microwave dish and tower will be provided for communication with SCE and the CAISO. The overhead 220 kV transmission conductors will be supported by a dead-end structure in the on-site substation.

2.l. Aviation Lighting

The Code of Federal Regulations Part 77 authorizes the FAA to establish the standard for determining obstruction in navigation space and sets forth requirements for notification of proposed construction. These regulations require notification for any construction that is over 200 feet in height above ground level. Notification is also required if the obstruction is less than specified heights and falls within the restricted airspace in the approach to airports. For airports with runways longer than 3,200 feet, the restricted space extends 20,000 feet (3.2 nautical miles) from the runway. For airports with runways of 3,200 feet or less, the restricted space extends 10,000 feet (1.6 nautical miles) from the runway. Aviation obstruction lighting will be provided as required by the Federal Aviation Administration (FAA).

Supporting structures for the proposed 230-kV transmission line are expected to be no higher than 110 feet and will not encroach into restricted space. Therefore, no Notice of Construction or Alteration filing with the FAA is required.

2.m. Site Stabilization, Protection, and Reclamation Practices

Site stabilization, protection, and reclamation practices have been discussed previously in Section 1.c. and will be accomplished through erosion and dust control practices, as well as vegetation treatment.

3. RELATED FACILITIES AND SYSTEMS

3.a. Transmission System Interconnect

3.a.1. Existing and Proposed Transmission System

Southern California Edison (SCE) is the utility operator of the existing transmission lines adjacent to the Project site's eastern boundary. The Project will interconnect to SCE's transmission system at the Pisgah 220 kV substation and will provide energy and/or ancillary services to the CAISO-controlled grid. Figure 12, Utility Plan included in Section 6, Maps and Drawings.

3.a.2. Ancillary facilities and substations

As an interconnection customer, the Project Owner is subject to, and obligated to comply with, CAISO's Large Generator Interconnection Procedures (LGIP).[1] On August 31, 2005, in compliance with the LGIP, the Project Owner submitted a request to interconnect the Project to the CAISO-controlled grid and the interconnection request was studied by the CAISO and SCE on the basis of project capacity of 850 MW. A System Impact Study completed on March 7, 2006 determined that a number of facility upgrades would be required to interconnect the Project's anticipated 850 MW output to the Pisgah substation, including expansion of the existing Pisgah substation to a 500 kV substation and certain 500 kV transmission upgrades (collectively, 500 kV Facilities).

While SCE plans to locate the upgraded 500 kV transmission lines within their existing right-of-way, it has not completed engineering work required to identify the specific location of the replacement transmission towers, the specific alignment of the transmission line in the vicinity of the Lugo Substation, or whether to enlarge or relocate the Pisgah substation. SCE will need to obtain permits from the CPUC in conjunction with the BLM for the 500 kV Facilities and the expansion or relocation of the Pisgah substation.

Because of the long lead times associated with permitting and constructing the 500 kV Facilities, in October 2006, the Project Owner requested that SCE conduct a study to determine how much, if any, of the Project Owner's requested 850 MW of generation capacity could be interconnected to the existing transmission facilities at the Pisgah substation and thereby allow for early partial operation of the Project until the 500 kV Facilities were completed. SCE concluded that, with certain more limited network upgrades, 275 MW could be accommodated without construction of the 500 kV Facilities. The Project Owner thereafter made arrangements to construct the Project in two phases. The subsequent transmission studies separately identified the network upgrades required for the interconnection of Phase 1 (275 MW) and Phase 2 (575 MW).

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1 CAISO, FERC Electric Tariff, Fourth Replacement Volume No. II, Appendix U.

To accommodate the 275 MW of Phase 1, SCE will expand the Pisgah substation in its existing right of way to allow for installation of the necessary generation interconnection equipment. SCE will either expand the Pisgah substation or relocate it to an area south of I-40. Energy will be delivered from the Pisgah substation over two existing 220 kV transmission lines to the Lugo substation located outside Hesperia, California. SCE filed a preliminary change of use ROW application with the BLM in March of 2010 and is currently working on refining that application.

The Project Owner intends that early interconnection of up to 275 MW would be a temporary interconnection until the 500 kV Facilities are in service, and the full requested generation output of 663.5 MW could be connected to the upgraded transmission system. When completed, the 500 kV Facilities will allow for the export of approximately 1,400 MW of additional generating capacity between the Lugo and Pisgah substations, including all of the energy produced by the Project.

3.a.3. Status of Power Purchase Agreements

The Project Owner is currently actively seeking an off-taker for the energy to be produced by the Project.

3.a.4. Status of Interconnect Agreement

On February 26, 2010, the Project Owner executed a Large Generator Interconnect Agreement (LGIA) with SCE and CAISO, for an aggregate of 850 MW output produced by SunCatchers. The Project Owner has coordinated with CAISO and SCE in regard to the inclusion of PV technology into the Project and CAISO has indicated that no additional studies would be required in order to effect delivery of energy at the Pisgah substation. In October 2010, the Project Owner suspended activities under the LGIA and such suspension has continued through the date of this Plan of Development. The Project Owner can remove the LGIA from suspension upon written notice to SCE.

3.a.5. General Design and Construction Standards

The Project Owner will meet all applicable design and construction standards required by the CEC's conditions as well as all applicable LORS.

3.b. Gas Supply System

Not Applicable

3.c. Other Related Systems

3.c.1. Communications System Requirements (Microwave, Fiber Optics, Hard Wire, Wireless) During Construction and Operation

The various components of the SCADA system and the onboard controllers associated with Tracker Blocks and SunCatchers will be interconnected with a system of underground and overhead fiber optic cables that will generally be routed together with the electrical collection system cables. One fiber optic cable and a microwave dish and tower will be provided for

communication with SCE and CAISO. Communications service for the main services complex will be obtained from local communication services companies by connecting to nearby existing communications lines.

4. OPERATIONS AND MAINTENANCE

4.a. Operation and Facility Maintenance Needs

The Project will be an "as-available" resource. The Project will be dispatched by the CAISO, through day-ahead, hour-ahead, and real-time scheduling, as required to meet the demands of the Southern California market. The market will dictate unit operations and total power requirements. The Project will operate approximately 3,750 hours per annum and is expected to have an overall availability of 99 percent or higher. The number of available operating hours is determined by the availability of the sun's energy at an appropriate strength.

During operation, maintenance activities will focus on the scheduled preventive maintenance and repairs of the solar generating equipment, as well as the building and ancillary support facilities. The maintenance and repair for solar system components will be coordinated through on-site personnel and technical support from the various warranty services of the original equipment manufacturers. Balance of plant maintenance, including buildings, plant auxiliaries, PV module and mirror washing, electrical maintenance, etc., will be managed and performed by the Project Owner and contracted local vendors.

It is expected that the plant will be operated with a staff of approximately 112 full-time employees for the full 663.5 MW capacity of the Project. The plant will operate 7 days per week, generating electricity during normal daylight hours. Preventive maintenance activities will occur during normal working hours (5 to 6 days per week) with the occasional need to conduct emergency repairs to certain solar generating equipment or plant facilities during non-scheduled or weekend hours.

To achieve optimal performance levels, a structured preventive maintenance program and periodic scheduled outages will be developed to routinely inspect, monitor, and replace worn parts to minimize unplanned system failures. Total productive maintenance techniques and routine equipment inspections/measurements will provide valuable information for implementing trending and predictive maintenance procedures. A centralized computerized maintenance management system will be designed and managed by internal management personnel to collect and trend all maintenance related activities, including schedules, parts inventory, and testing procedures.

The Project's operations and maintenance plan is designed to optimize net generation in a manner consistent with safety and regulatory requirements. The Project Owner expects to employ a well-designed multi-phase warranty and insurance program to minimize technology risk and maximize generation. Independent of routine maintenance and technical support services, separate contracts will be initiated with the appropriate component suppliers to provide the necessary quantity and quality of repair or replacement parts to ensure continuous operation of the solar generating systems. An adequate supply of spare parts will be stored on site and, as necessary or economical, on consignment at each vendor warehouse to ensure a reliable source for necessary repairs of damaged or worn components.

The solar generating equipment will be continuously monitored and controlled from the central control room during normal working hours with 24 hour monitoring from a remote source. The generation units, auxiliary systems and balance of plant facilities are connected

to the SCADA system. From this central location, systems are monitored and maintenance staff is dispatched as required for addressing any system adjustment or repair needs. The SCADA system will be interconnected to a remote monitoring source for additional support and back-up services.

4.b. Maintenance Activities, Including Mirror Washing and Road Maintenance

4.b.1. PV Equipment Maintenance

The PV equipment will require periodic maintenance as needed to ensure efficient functioning. Standard maintenance for the system is as follows:

Washing: It is anticipated that the PV modules will be washed at least twice a year. A pickup truck with a water tank will be used for washing the modules. Modules will be manually sprayed by an employee with a washing wand and a hose. Water will be sprayed on access path surfaces for dust suppression purposes.

Scheduled Maintenance: PV modules are durable and will require minimal routine maintenance. There will be the need to periodically inspect the modules and make necessary alignment adjustments (i.e. tighten fasteners) or replace damaged modules. The single-axis tracker blocks utilize a single 3 to 5 hp motor connected to a matrix of contiguous gear-driven shafts. These Tracker Block shafts and associated gears/bearing assemblies will require lubrication approximately twice a year.

Unscheduled Maintenance: Unscheduled maintenance will occasionally be required due to uncontrollable circumstances such as severe weather or premature failure of components. These unscheduled repairs will be coordinated through the central maintenance system and be undertaken in a manner to minimize impacts to the continued operation of the plant.

4.b.2. SunCatcher Equipment Maintenance

The SunCatcher unit will require periodic maintenance as needed to ensure efficient functioning. Standard maintenance for the system is as follows:

Washing: It is anticipated that the SunCatchers will be washed no more than 12 times per year. A truck with a water tank and spray gun will be used to wash the SunCatcher mirrors.

Scheduled Maintenance: An integral component of the SunCatcher is the PCU. To ensure high availability of the PCU, a periodic maintenance schedule is in place to perform routine maintenance cycles. See Figure 23, Typical Maintenance & Replacement Schedule below. These cycles are similar to periodic maintenance cycles found in other reciprocating engine applications. Other generation components are designed for the life of the facility and require either no, or infrequent, maintenance (e.g. dish steel support structure, pedestal, tracking drive system). To keep each SunCatcher unit operating as efficiently as possible and to minimize outage time, the PCU is designed so that it can be easily removed and replaced with a new PCU that is part of the facility's rotating spare part inventory.

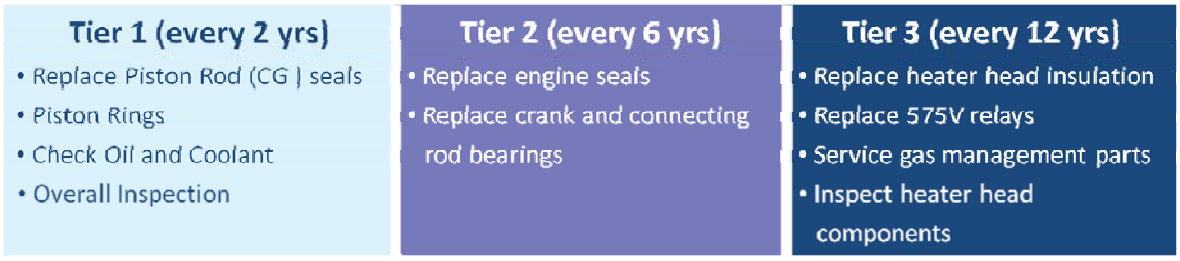

Figure 23 Typical Maintenance & Replacement Schedule

It is anticipated that for every 100 PCUs, a spare PCU will be kept on site in a rotating spare inventory for periodic tiered maintenance or unscheduled maintenance as necessary. Because of the distributed nature of the SunCatcher system, individual units can be repaired without affecting overall Project operations. Once it is determined that a PCU needs to undergo immediate repair, the SunCatcher unit is rotated to the off-sun position, the PCU is removed and replaced with a refurbished PCU from the rotating spare inventory. The SunCatcher is then rotated back to the on-sun position and resumes operations. This entire process can be completed in less than 1 hour, minimizing any downtime during operational hours. When a PCU is not performing optimally, the SunCatcher unit will remain on-line until the sun sets and then the PCU will be replaced during non-operational hours.

4.b.3. General Plant Maintenance

The Project Owner will ensure balance of plant maintenance is provided to support the preventive and outage maintenance requirements for: substations, generator electrical collection, cabling systems, building facilities, the hydrogen system, 48 volt DC uninterrupted power supplies and network communications, whether through its own personnel or through contractual arrangements.

4.c. Operations Workforce and Equipment

4.c.1. Workforce

Operations and Maintenance plans are designed to maximize facility reliability, availability and safety of personnel and equipment. The plans will include preventive and outage maintenance for the solar field generating systems and balance of plant equipment and periodic cleaning of the PV modules concentrator dishes to reverse accumulated soiling.

During operations, Project Owner will endeavor to employ qualified personnel from the local area. Socioeconomic analysis indicates that 88% of labor force in San Bernardino County (790,000 workers) reside within 2 hours of the Project site. Recent local unemployment rates in San Bernardino County (February 2011-preliminary) are high, with rates of 16.9 percent and 16.4 percent in Barstow and Victorville, respectively, compared to a statewide average of 12.3 percent (California EDD February 2011). Anticipated operations and maintenance staff is estimated to be 112 personnel. See Table 14, Project Operations and Maintenance Personnel Requirements below. Therefore, the Project Owner is optimistic that the majority of the workforce will come from the local area.

Table 14 Project Operations and Maintenance Personnel Requirements

Worker Title	Quantity	Comments
General Manager	1	Overall Manager of Operations
Plant/Performance Engineer	1	Environmental, health and safety responsibilities
Power/controls Engineer	1	Responsible for switchyard, inverters, 34.5 kV ac collection
Maintenance Supervisor	1	Manager of all maintenance personnel
Water Truck Operators	4	Daily dust control and grounds maintenance
Module & Mirror Cleaning Operators	40	Clean all PV and SunCatcher modules
PV Maintenance Technicians	10	Preventive maintenance and repairs for PV arrays
SunCatcher Maintenance - Supervisor	1	Oversees all SunCatcher activities
SunCatcher Maintenance Technicians	44	Preventive maintenance and repairs for SunCatchers
Machinist	1	Responsible for providing machine support
Instrument & Controls - Lead	1	Very skilled supervisor with computer skills
Instrument & Controls Technicians	2	Controls systems and collection systems wiring
General Administration	2	Maintains building, water treatment and hydrogen plant
Security/Misc.	3	Maintains building and grounds (possibly outsourced)
Total:	112	

4.c.2. Equipment

The operation and maintenance plan will require certain standard and specialty equipment to support the daily preventive maintenance and repair tasks associated with the solar power generating plant and ancillary facilities. The typical equipment required to support the operation and maintenance system:

- Typical machinist equipment (lathes, drill presses, welding units, etc.);
- Aqueous parts washing systems;
- Various pumps and motors;
- Standard electrical tools;
- Standard millwright tools;
- Building support systems (RO unit, HVAC, compressed air, etc.);
- Transport vehicles (pick-up trucks, golf carts, 4-wheel ATVs, etc.);
- Water trucks and water spray systems; and
- Forklifts, man lifts, Bobcats and graders.

5. ENVIRONMENTAL CONSIDERATIONS

5.a. General Description of Site Characteristics and Potential Environmental Issues

5.a.1. Existing Site Conditions

The Project is located in an undeveloped area within the Mojave Desert. The Project site slopes gently to the northeast, with steeper sloping beyond the northeast boundary line. The central and western portions of the Project site are characterized by low and moderate relief alluvial zones and washes. The Project site is primarily open land ranging in elevation from approximately 1,800 to 2,280 feet above msl. The portion of the Project site between the railroad and I-40 is isolated by the highway and railroad and portions of the Project site have been subject to repeated disturbance from pipeline development.

Figure 1 in the Maps and Drawings section of this document shows the regional setting of the Project. Immediate surrounding land uses include the Pisgah Area of Critical Environmental Concern (ACEC), Ord-Rodman Desert Wildlife Management Area (DWMA)/ACEC, Cady Mountains Wilderness Study Area (WSA), sparse rural and agricultural development, and pockets of industrial infrastructure. This infrastructure includes I-40 and several high-voltage transmission lines, located to the south and east of the site, respectively. Additionally, the railroad bisects the Project site.

The Project site receives most of its precipitation during winter months. The average annual precipitation is approximately 3.8 inches and average monthly temperatures range between 36 and 104 degrees Fahrenheit.

There are several BLM designated routes located within the Project area that are used currently by OHV recreation users. There has been significant disturbance from OHV recreation and grazing activities that have occurred off of designated routes inside the proposed Project area.

The majority of the Project site is Mojave Creosote bush scrub. The dominant shrub species are creosote bush and white bursage.

5.a.2. Special or Sensitive Species and Habitats

Table 15, Special Status Species, Their Status and Potential Occurrence below presents a summary of special-status species, their status, and potential occurrence at the Project site, as set forth in the CEC Decision.

Table 15 Special Status Species, Their Status and Potential Occurence

Scientific Name	Common Name	Status	Potential For Occurrence On-Site
PLANTS			
Androstephium breviflorum	Pink funnel-lily, Small-flowered androstephium	CNPS 2.2	Present
Astragalus jaegerianus	Lane Mountain milk-vetch	FE, CNPS:1B.1	Not likely to occur
Astragalus lentiginosus var. borreganus	Borrego milk-vetch	CNPS: 4.3	Low
Blepharidachne kingii	King's eyelash grass	CNPS: 2.3	Low
Calochortus striatus	Alkali mariposa lily	BLM S, CNPS: 1B.2	Not likely to occur
Camissonia boothii var. boothii	Booth's evening primrose	CNPS: 2.3	Moderate
Cassia – see Senna			
Castela emoryi	Emory's crucifixion thorn	CNPS: 2.3	Low
Cleomella brevipes	Short-pedicelled cleomella	CNPS: 4.2	Low
Coryphantha alversonii [Escobaria vivipara var. alversonii]	Foxtail cactus	CNPS: 4.3	Present
Coryphantha chlorantha [Escobaria vivipara var. deserti]	Desert pincushion	CNPS: 2.1	Low
Coryphantha vivipara var. rosea [Escobaria vivipara var. rosea]	Viviparous foxtail cactus	CNPS: 2.2	Low
Cryptantha holoptera	Winged cryptantha	CNPS: 4.3	Present (unconfirmed)
Cymopterus deserticola	Desert cymopterus	BLM S, CNPS: 1B.2	Low
Cymopterus multinervatus	Purple-nerve cymopterus	CNPS: 2.2	Low
Cynanchum utahense	Utah vine milkweed	CNPS: 4.2	Present
Eriophyllum mohavense	Barstow woolly-sunflower	BLM S, CNPS: 1B.2	Low
Escobaria – see Coryphantha			
Gilia – see Linanthus			
Linanthus maculatus	Little San Bernardino Mountains linanthus	BLM S, CNPS: 1B.2	Not likely to occur
Loeflingia squarrosa var. artemisiarum	Sagebrush loeflingia	CNPS: 2.2	Not likely to occur
Lupinus sp.	Undescribed lupine	n/a	Low
Mentzelia eremophila	Solitary blazing-star	CNPS: 4.2	High
Mentzelia tridentata	Creamy blazing-star	BLM S, CNPS: 1B.3	Low
Mimulus mohavensis	Mojave monkeyflower	BLM S, CNPS: 1B.2	Low

Scientific Name	Common Name	Status	Potential For Occurrence On-Site
Muilla coronata	Crowned muilla	CNPS: 4.2	Present (unconfirmed)
Nemacaulis denudata var. gracilis	Slender woolly-heads	CNPS: 2.2	Low
Pediomelum castoreum	Beaver Dam breadroot	CNPS: 4.3	Low
Penstemon albomarginatus	White-margined beardtongue	BLM S, CNPS: 1B.1	Present
Phacelia coerulea	Sky-blue phacelia	CNPS: 2.3	Not likely to occur
Polygala acanthoclada	Thorny milkwort	CNPS: 2.3	Low
Senna covesii [Cassia covesii]	Coves' cassia	CNPS: 2.2	Present (unconfirmed)
Sphaeralcea rusbyi var. eremicola	Rusby's desert mallow	BLM S, CNPS: 1B.2	Low
Tripterocalyx micranthus	Small-flowered sand-verbena	CNPS: 2.3	Present (unconfirmed)
Wislizenia refracta ssp. refracta	Jackass-clover	CNPS: 2.2	Moderate
REPTILES			
Anniella pulchra pulchra	Silvery legless lizard	CSSC	Low
Gopherus agassizii	Desert tortoise	FT, ST	Present
Heloderma suspectum cinctum	Banded gila monster	BLM S, CSSC	Low
Lichanura trivirgata	Rosy boa	n/a	Moderate
Uma scoparia	Mojave fringe-toed lizard	BLM S, CSSC	Present
BIRDS			
Accipiter cooperii	Cooper's hawk	CDFG WL	Low
Aquila chrysaetos	Golden eagle	BLM S, SP, CDFG WL	Present
Asio otus	Long-eared owl	CSSC	High
Athene cunicularia	Western burrowing owl	BLM S, CSSC	Present
Buteo regalis	Ferruginous hawk	CDFG WL	High
Buteo swainsoni	Swainson's hawk	BLM S, ST	Present (not nesting)
Chaetura vauxi	Vaux's swift	CSSC	Low
Charadrius montanus	Mountain plover	BLM S, CSSC	Moderate
Circus cyaneus	Northern harrier	CSSC	Low
Eremophila alpestris actia	California horned lark	CDFG WL	Low
Falco columbarius	Merlin	CDFG WL	High
Falco mexicanus	Prairie falcon	CDFG WL	Present (not nesting)
Lanius ludovicianus	Loggerhead shrike	FBCC, CSSC	Present
Polioptila melanura	Black-tailed gnatcatcher	n/a	High
Toxostoma bendirei	Bendire's thrasher	BLM S, CSSC	Present
Toxostoma lecontei	LeConte's thrasher	BLM S, CDFG WL	Present
MAMMALS			
Antrozous pallidus	Pallid bat	BLM S, CSSC	Moderate
Corynorhinus townsendii	Townsend's big-eared bat	BLM S, CSSC	Present
Euderma maculatum	Spotted bat	BLM S, CSSC	Low

Scientific Name	Common Name	Status	Potential For Occurrence On-Site
Eumops perotis	Western mastiff bat	BLM S, CSSC	High
Ovis Canadensis nelsoni	Nelson's bighorn sheep	BLM S, SP	Present
Spermophilus mohavensis	Mohave ground squirrel	BLM S, ST	Not Likely to Occur
Taxidea taxus	American badger	CSSC	Present
Vulpes macrotis arsipus	Desert kit fox	n/a	Present

FE = Federally listed Endangered
FT = Federally listed Threatened
FD = Federally Delisted
FC = Federal Candidate
FBCC = Federal Bird of Conservation Concern
BLM S = BLM Sensitive
SE = State listed Endangered
ST = State listed Threatened (wildlife)
SR = State listed Rare (plants)
CSSC = California Species of Special Concern (wildlife)
SP = State Fully Protected Species
CDFG WL = California Department of Fish and Game Watch List species

CNPS (California Native Plant Society) Designations:
List 1A = Plants presumed extinct in California
List 1B = Plants considered by CNPS to be rare, threatened, or endangered in California, and throughout their range
List 2 = Plants rare, threatened, or endangered in California, but more common elsewhere in their range
List 3 = Plants about which we need more information – a review list.
List 4 = Plants of limited distribution – a watch list

CNPS Threat Rank:
.1 = Seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 = Fairly endangered in California (20-80% occurrences threatened)
.3 = Not very endangered in California (20% of occurrences threatened or no current threats known)

With the incorporation of the mitigation measures described in Appendix F, Conditions of Certification, the Project will not result in direct, indirect, or cumulative impacts to biological resources. Detailed description of the special status plants and wildlife with the highest potential to be impacted by the Project is provided below.

5.a.2.1. Special Status Plants

The Project Owner has conducted multiple season/multiple year botany surveys, including fall 2010, on the Project site. See Figure 25, Special Status Species Detected During URS Surveys included in Section 6, Maps and Drawings.

White-margined beardtongue: Five distinct occurrences of white-margined beardtongue, totaling twenty-five individuals, were detected within the Project area. One 2008 occurrence, representing one individual plant, was not relocated in 2010. The season's late and abundant rains can favor perennial species such as penstemons, and all reference populations and occurrences detected onsite were in flower or beginning to bud at the time of the April surveys. Because of its distinct visual signature and timing of the surveys, as well as the intense survey methodology (*i.e.*, close transect spacing within suitable habitat), there is a high probability that all occurrences of this species have now been detected within the Project area.

Crucifixion thorn: Three individuals of crucifixion thorn were detected within the area surveyed during the first round of spring surveys in 2010. One of these individuals was also detected during the 2008 surveys. This can be a fairly large shrub species that is easily identifiable. The Project site will avoid all three of these individuals.

Small-flower androstephium: Small-flower androstephium was found to be ubiquitous throughout the sandy southern portion of the Project area. Over 1,500 individual occurrences

were recorded during this first round of spring surveys. In any given year, only a proportion of the bulbs in a population produce above-ground growth, and the species has an inherently lower detection rate associated with the cryptic nature of its seedling stage and bulb dormancy. The majority of the detected plants occurred in a large and contiguous population in varying densities throughout most of the southern portion of the site.

Undescribed lupine: An undescribed lupine species was detected in five locations north of the present Project boundary. The unnamed species does have some taxonomic precedent. This is an annual species with blue flowers.

5.a.2.2. Special Status Wildlife Species

A total of nine special status wildlife species were detected in the Project site or immediate vicinity during field surveys: desert tortoise, Mojave fringe-toed lizard, American badger, loggerhead shrike, Le Conte's thrasher (*Toxostoma lecontei*), Bendire's thrasher, burrowing owl, golden eagle (*Aquila chrysaetos*), and Swainson's hawk (*Buteo swainsoni*). The following species accounts are provided for the special status wildlife species detected onsite, including Nelson's bighorn sheep, which was not detected onsite.

Desert Tortoise: Desert tortoise is widely distributed in the deserts of California, southern Nevada, extreme southwestern Utah, western and southern Arizona, and throughout most of Sonora, Mexico. Desert tortoise populations are declining because of various factors, including the spread of a fatal respiratory disease, increases in raven populations that prey on juvenile tortoises, and habitat loss and degradation because of various extensive and intensive land uses. Only the Mojave population of desert tortoise is Federal- and State-listed as threatened. Typical tortoise habitat consists of firm but not hard ground, usually soft sandy loams and loamy sands that allow for burrow construction (Karl 1983). Desert tortoise primarily occur in four subpopulations in the California Mojave Desert (Ord-Rodman, Superior-Cronese, Fremont-Kramer, and Joshua Tree DWMAs). Outside of these DWMAs, tortoises tend to occur at much lower densities. This species is mostly found in creosote bush scrub, with lower densities occurring in Joshua tree woodland and saltbush scrub. The topography where this species is typically found includes flats, low valleys, bajadas, and low hills between elevations of 2,000 and 3,300 feet and occasionally above 4,100 feet.

The diet of desert tortoises consists mainly of annual plants and grasses, but also contains perennial plants such as cacti and native forbs. When available, certain non-native plant species are also eaten (West Mojave Planning Team 1999). Desert tortoises are most active when plants are available for forage or when pooled water is available for drinking, usually from March through early June and again between September and early November (Marlow 1979). They typically have overlapping home ranges averaging between 5 and 131 acres, which can fluctuate in size on a year-to-year basis based on several factors such as sex of the tortoise, rainfall, availability of resources, and other factors (Berry 1986, Duda 1999, CDFG 2000). Individuals commonly traverse 1,500 to 2,600 feet/day within their home range, and males have been recorded traveling up to 3,200 feet within their home range. Mojave desert tortoises are also known to disperse more extended distances (1.9 miles in 16 days and 4.5 miles in 15 months; Berry 1986).

Focused desert tortoise surveys using USFWS 2009 protocols were conducted in 2010 to estimate the population of desert tortoise onsite. Results are shown on Figure 24, Desert Tortoise Grid and Sightings included in Section 6, Maps and Drawings. Identified within the 4,613 acre footprint of the Project are six adult desert tortoise, three juvenile tortoise and one occupied burrow.

Mojave Fringe-toed Lizard: Mojave fringe-toed lizard (MFTL) inhabits areas of fine windblown sand in the Mojave Desert from the southern end of Death Valley south to the Colorado River around Blythe, and into extreme western Arizona. Suitable habitat includes sparsely vegetated arid areas with fine, wind-blown sand, including dunes, flats with sandy hummocks formed around the bases of vegetation, washes, and the banks of rivers. The MFTL requires fine, loose sand for burrowing. The elevation range for this species is approximately 300 to 3,000 feet (Stebbins 2003). Adults go underground in the sand or in a burrow in the fall, and emerge in late winter. Young lizards may go underground later and emerge earlier, or may remain active all year. Their diet consists primarily of small invertebrates such as ants, beetles, and grasshoppers, along with occasional blossoms, leaves, and seeds. Clutches of one to five eggs are laid from May to July. The Project site supports one patch of MFTL-occupied habitat (16.9 acres) between the railroad and I-40, with one MFTL individual observed during surveys. Most of the MFTL observations were found within the BLM ACEC, supporting up to five locations of occupied MFTL habitat.

Bendire's Thrasher: Bendire's thrasher is found in the southwestern U.S., and northwestern Mexico, from southern Nevada, southern Utah and southwestern Colorado south to central Sonora in Mexico. Within this range, its distribution is patchy and in some cases poorly known (BirdLife International 2008). Individuals in the northern portion of the range migrate south in the winter and overlap with southern residents (BirdLife International 2008). Breeding individuals favor relatively open grassland, shrubland or woodland with scattered shrubs or trees; Bendire's thrasher is not found in dense vegetation. It forages primarily on the ground for insects and other arthropods, but will also eat seeds and berries (BirdLife International 2008). In the Mojave Desert, migration begins as soon as breeding finishes and all birds have left the breeding grounds by late August (BirdLife International 2008). On-site observations of Bendire's thrashers were made during Project surveys.

Le Conte's Thrasher: Le Conte's thrasher is found from southern Mono County, and western and southern parts of the San Joaquin Valley in the southern California deserts, down to the Mexican border. Within this range, its distribution is uncommon to rare locally (CDFG 2005). This species is not migratory and typically occupies home ranges of approximately 100 acres in open desert wash, Joshua tree habitat with scattered shrubs, and assorted desert scrub habitats. Territories average 15 acres, with nests occurring in dense, spiny shrubs or densely branched cactus. This species uses scattered shrubs and cactus for cover, most frequently saltbush and cholla. It forages primarily on the ground for insects and other arthropods, but will also eat seeds, small lizards and other small vertebrates (CDFG 2005). There was one observation of Le Conte's thrasher in 2008 within the Project vicinity.

Loggerhead Shrike: The loggerhead shrike is an uncommon year-round resident of grassland and desert scrub. It prefers open habitat with scattered shrubs, trees, posts and other perches (CDFG 1990). This species occurs throughout central and southern California. The Great Basin population in California south to Inyo County migrates during the winter;

however, it is a year-round resident in warmer climates. Territories and home ranges are the same size and vary from 11 to 40 acres, averaging approximately 18.7 acres (CDFG 1990). Nests are well concealed and usually found in densely foliaged shrubs or trees, typically below 15 feet in height, although found much higher as well. It preys mostly on insects, but is also known to take small birds, mammals, and various other invertebrates. This species searches for prey from perches at least two feet above ground, swooping directly upon prey once located. It has also been known to hover in search of prey and occasionally hawk insects. It is known as the "butcher bird" for its habit of skewering prey on small twigs or barbed wire before consuming them (Unitt, 2004). There was one observation of loggerhead shrike made in 2008.

Burrowing Owl: The burrowing owl is a small, ground dwelling bird that inhabits open habitats such as grasslands, agricultural fields, and disturbed areas in the western half of the United States down into Baja California and central Mexico (Johnsgard 1988). Burrowing owls use burrows throughout the year for shelter from weather and predators, and for nesting during the breeding season (February 1 to August 31). In Southern California, the most commonly used rodent burrow is that of the California ground squirrel (*Spermophilus beecheyi*). Burrowing owl nesting distribution is strongly correlated to local ground squirrel burrow distribution (Collins 1979). Burrowing owls form short-term pair bonds with male territoriality peaking during pair formation and declining after egg laying. Not all individuals capable of breeding do so every year. Burrowing owls have declined through much of their range because of habitat loss resulting from urbanization, agricultural conversion, and destruction of ground squirrel colonies (Remsen 1978). The incidental poisoning of burrowing owls and the destruction of their burrows during eradication programs aimed at rodent colonies has also been a large factor in their population decrease (Collins 1979; Remsen 1978; and Zarn 1974). Burrowing owls are relatively tolerant of lower levels of human activity.

Protocol surveys were conducted in January 2010, and two burrowing owls and eleven burrows with sign were identified approximately 0.5 miles north of the Project site. The Project site contains suitable foraging and breeding habitat and one individual was observed in the northern portion of the Project site. See Appendix M, Burrowing Owl Survey Report.

Golden Eagle: Golden eagles are distributed throughout North America (Johnsgard 1990). Golden eagles occur as breeding residents in the western half of the United States and formerly nested in the northeast (Terres 1980; Johnsgard 1990). This species is an uncommon resident throughout California (Zeiner, *et al*., 1990; Unitt 1984). Golden eagles forage in grassy and open shrubby habitats and nest primarily on cliffs, with secondary use of large trees (*e.g.,* oaks and sycamores). Breeding pairs may occupy territories of several square miles, within which they may often use several nest sites, shifting nest sites from year to year. This species has declined because of loss of foraging and nesting habitat to urban and agricultural development, human persecution (illegal shooting), incidental poisoning of prey species (*e.g.,* ground squirrels and prairie dogs), egg collecting, power line electrocution, and human disturbance at nest sites (Snow 1973; Johnsgard 1990; Scott 1985).

Golden eagles were observed during both the 2007 and 2008 survey season. Both observations were fly-overs. There were no nests or breeding activity observed on the Project site. The Project Owner conducted helicopter surveys on March 11 and 12, 2010.

The survey detected approximately 22 stick nests including eight inactive, but potential golden eagle nests, and one active nest that contained an incubating adult golden eagle. The active nest is located approximately 3.5 miles east of the proposed Project site.

Swainson's Hawk: Swainson's hawk breeds throughout much of the Rocky Mountains and western Great Plains, from southern Alberta and Saskatchewan in Canada to northern Mexico. Its breeding range in California is limited to the northern portion of the state. It is most often found in grasslands, shrublands, and agricultural areas, where both open land for foraging, and trees for roosting and nesting are available. Ground squirrels, gophers, voles, mice, small birds, lizards, and snakes form the bulk of the hawk's prey. Sometimes they hunt on the ground, lurking near ground squirrel holes until their prey emerges. Declines in Swainson's hawk populations have been reported across much of the species' range over the past 50 years. Loss or degradation of nesting, foraging, wintering, and migration stop-over habitat are among the primary reasons for the decline, but illegal shooting and electrocutions on power lines have also played roles. The hawk's insect diet makes it especially vulnerable to pesticide poisoning in agricultural fields. There were no observations of Swainson's hawk in 2007 and a single observation (fly-over) in 2008. This species is not expected to breed in the area and is likely a migrant.

American Badger: The American badger is an uncommon resident of level, open areas in grasslands, agricultural areas, and open shrub habitats. It digs large burrows in dry, friable soils and feeds mainly on fossorial mammals (*e.g.*, ground squirrels, gophers, rats, and mice). Badgers are primarily active during the day, but may become nocturnal in close proximity to humans. The home range of badgers has been measured at 1,327 to 1,549 acres for males, and 338 to 751 acres for females in Utah (Lindzey 1978) and 400 to 600 acres for females in Idaho (Messick and Hornocker 1981). Mating occurs in late summer or early fall. Two to three young are born 183 to 265 days later in March or April (Long 1973). Badgers are known to live at least 11 to 15 years (Messick and Hornocker 1981). Threats to badgers include urban and agricultural development of habitat, and possibly excessive trapping and persistent poisoning of prey in some areas (Zeiner, *et. al.,* 1990). American badger is present within the Project area, and three burrows were detected during 2010 surveys conducted by the Project Owner. Suitable foraging habitat and prey items for this species are broadly distributed across the Project site.

Nelson's Bighorn Sheep: Nelson's bighorn sheep is a subspecies of bighorn sheep that occurs in the Southwest desert regions of the U.S. The preferred habitat of bighorn sheep is steep, rocky areas that are visually open (Wehausen unpublished data). Bighorn sheep tend to live in semi-open, precipitous terrain with rocky slopes, ridges, and cliffs or canyons. Steep slopes and cliffs are used to escape from predators such as coyotes and cougars. Home ranges for rams vary from 20.5 to 38.6 square miles (Stephenson 2007). The Nelson subspecies has become well adapted to desert mountain environments; they are typically found in small bands in areas with little to no permanent water. Their diet consists of grasses, forbs, and sedges.

The Nelson subspecies began their population decline in the mid-1800s at the time of heavy human settlement of the West (SNMNH 2008). This decline can be attributed, at least in part, to degradation of their habitat due to development, road building, water-management practices, and recreational activities. Bighorn sheep have also been affected by disease,

sometimes passed on to them by domestic sheep, and are often preyed upon by mountain lions and probably by domestic dogs as well. In some places where bighorn populations have been extirpated, new herds have been reintroduced, but many parts of their original range are no longer suitable (SNMNH 2008).

There is a documented natural population of between 25 and 50 individuals in the Cady Mountains that is a part of the larger central Mojave metapopulation (Torres et al. 1994, 1996). No Nelson's bighorn sheep were observed during the 2007 or 2008 surveys; however, helicopter surveys conducted by the Project Owner observed 62 Nelson's bighorn sheep within 10 miles of the Project site. Nelson's bighorn sheep may use portions of the Project site for foraging and possibly inter-mountain movement to some degree. See Appendix N, Biological Resources Baseline Survey and Appendix O, Biological Resources Technical Report for additional information.

In compliance with the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), a Staff Assessment and Environmental Impact Statement were prepared for the Calico Solar Project (Project). Included in the NEPA/CEQA documents were mitigation measures to reduce impacts to the environment. The BRMIMP is intended to provide a feasible strategy that would avoid, minimize, and offset Project-related impacts to biological resources, specifically "special status" species and their habitats, from the construction and operation of the Project. See Appendix D, Draft Biological Resources Mitigation Implementation and Management Plan (BRMIMP).

The Project Owner has prepared a draft Worker Environmental Awareness Program (WEAP) to be implemented for the Project. The WEAP will discuss the locations and types of sensitive biological resources on the Project site and adjacent areas and explain the reasons for protecting these resources. The WEAP also describes temporary and permanent habitat protection measures to be implemented on-site. Appendix P, Draft Worker Environmental Awareness Program (WEAP).

5.a.3. Air Quality

The Project site is located in the Mojave Desert Air Basin, in an area designated as non-attainment for federal and state ozone and PM10 standards, and the state PM2.5 standard. All other pollutants are either in attainment or unclassified. Project construction and operation activities with the potential to create emissions include grading/excavation, movement of construction equipment and exhaust from vehicles and heavy equipment. However, with the implementation of the mitigation measures described in Appendix F, Conditions of Certification, Project impacts to air quality would be less than significant.

5.a.4. Special Land Use Designations

Land use within the area of the Project site is dominated by open space/public land administered by the BLM and, to a lesser extent, by recreational, military and community uses, with small portions in industrial and urban uses. One rural residence is located approximately 2 miles east of the eastern border of the Project site. The next closest residence is located over 5 miles to the southwest of the Project site. Past and present activities, including residential and commercial development, off-highway vehicle use,

infrastructure development (highways and roads), and agricultural activities, have resulted in changes to land use in what was a relatively undeveloped region.

Public lands within the Project site are designated multi-use Class M (moderate) and Class L (limited) by the BLM. Private lands under the jurisdiction of the County of San Bernardino adjacent to the Project site are zoned resource conservation. Land Water Conservation Fund (LWCF) mitigation lands (southwest corner of Section 5) and donated lands (northwest corner of Section 17) are also located within the Project site boundary. These lands total approximately 96 acres.

5.a.5. Cultural and Historic Resource Sites and Values

A records search was performed within one-half mile radius of the Project site, laydown area, and appurtenant linear facilities. With the exception of a few recent studies, the majority of the previous investigations uncovered during the records search were conducted more than 15 years ago. An initial Class III Intensive Field Survey was conducted by the Project Owner between August 4, 2008 and October 31, 2008. Additional field surveys with more refined site recordation were conducted between October 2009 and March 2010.

The results of the field investigations were incorporated into the Final Cultural Resources Technical Report, submitted to the BLM. The cultural resources assessment prepared for the Project includes: a description of the Project area and affected environment; existing site conditions; a summary of the prehistory, ethnography, history of the region; a review of site records for previously completed cultural resource investigations and recorded sites in the Project APE and within a 1-mile study area surrounding the Project area; results of the archaeological and historic architecture pedestrian surveys of the Project APE; Native American consultation; environmental consequences; cumulative effects; mitigation measures; compliance with LORS; agencies and agency contacts; permits required and permitting schedule and references.

BLM determined that three of the 119 archaeological sites are eligible for nomination to the National Register for Historic Places (NRHP). The Project boundary was revised to exclude all or the portions of these three sites determined to be contributing to their eligibility. Archeologists for the Project Owner and the BLM concur that, based on surface observations, the data potential has been exhausted through recordation for all archeological sites within the Project site, and are therefore not eligible for nomination to the NRHP.

The portion of Route 66 within the Project area of analysis was determined to be contributing to the significance of Route 66 and is potentially eligible for inclusion in the NRHP under Criterion A for its association as one of the first all-weather highways in the United States. Construction and operation of the Project would result in a direct visual effect to Route 66. It was found that due to the size, scale, and dominance of the Project, the travel experience of this section of Route 66 will be permanently impaired. As such, a Programmatic Agreement was developed between the BLM and the State Historic Preservation Officer (SHPO). Appendix Q, Programmatic Agreement.

5.a.6. Native American Tribal Concerns

The Native American Heritage Commission (NAHC) was contacted on July 22, 2008 to request a search of the Native American Sacred Lands File (SLF) as an aid in determining the presence of Native American sacred sites within the Project APE. A list of Native American contacts that may have knowledge of known cultural resources or sacred sites within the Project APE was also requested.

The NAHC responded on July 24, 2008, and indicated a records search of the SLF "failed to indicate the presence of Native American cultural resources in the immediate Project Area." In addition to the response letter, the NAHC also provided a Native American contact list. Letters offering formal consultation were issued by the BLM Barstow Field Office on November 5, 2008.

BLM has led ongoing tribal consultation throughout the regulatory review of the Project. The Project Owner participated in a meeting on April 29, 2010 with BLM and members of tribes to discuss the development of a Programmatic Agreement. The final PA has been issued and signed for the Project.

5.a.7. Recreation and OHV Conflicts

Recreational activities, including camping and off-road vehicle use, are permitted on the Project site. Surrounding recreational areas include the Cady Mountain Wilderness Study Area (WSA) and the Rodman Mountains (approximately 8 miles south of the Project). While the Project site is not designated as an Off-Highway Vehicle (OHV) area, travel is allowed on the designated open routes within the Project site.

The Project will eliminate other potential uses on the BLM administered public lands (e.g., recreation, travel, etc.). Existing designated open routes would be terminated at the Project site boundary, and would not be available for public use. However, the Project will create an access road around the Project to allow the public access to the Cady Mountains and nearby private property that is not a part of the Project. A desert tortoise fence will be installed on the outside of these perimeter roads to ensure that desert tortoise do not enter the roads.

5.a.8. Other Environmental Considerations

5.a.8.1. Soil and Water Resources

The Project site lies within the Lavic Groundwater Basin (Basin); groundwater flow at the Project site flows toward the southeast. The largest source of recharge to the Basin is rainfall infiltration. Analytical test results conducted on water samples collected from the Project's well indicate groundwater contains 1,340 mg/L total dissolved solids. The average use of groundwater during the construction and operation of the Project is less than the recharge rate. Additionally, no other users are known to rely on the recharge. Therefore, the Project will not affect groundwater levels or flow from discharging playas.

The on-site drainage features exhibit a mixed pattern of sheet flow or shallow concentrated flow across isolated, wide areas of land; there are no perennial streams or well-defined channels within the Project site. The Carrizo-Rositas-Gunsight soil association occupies the

majority of the site, while the Nickel-Arizo-Bitter association is present over much of the southern portion of the site, south of the railway. The Rock Outcrop-Lithic Torriorhents-Calvista association is present in the mountains along the northern site perimeter and the Rock Outcrop-Upspring-Sparkhule association is present on the southwest corner of the Project site, as well as north and northwest of the site. With implementation of the mitigation measures proposed in Appendix F, Conditions of Certification, the Project is not expected to affect stormwater flow.

5.a.8.2. Visual Resources

Visual resources in the area of the Project site have been affected by past and present actions, including highway/roadway construction and limited industrial, commercial, and residential development. The viewshed of the area has already been modified with the presence of the existing transmission lines, I-40, a railway line, and property fencing in the immediate vicinity of the project. Although the Project site was never officially designated to be a Visual Resources Management (VRM) Classification, past draft designations and work performed by the Project Owner indicate an interim VRM Classification of Class III.

The Project would be clearly visible from I-40 and would have an effect on the viewshed from the road. The form, line, and texture of the visual environment will change as a result of the Project. The visual character of this area will change from open space to a regional center for large-scale solar power production. This change will be perceived differently by different people. To some people, the Project may detract from the desert environment, but to other people the project may be a point of positive visual interest. As one of the first large-scale projects of its kind in California, the Project has the potential to become a tourist attraction, drawing visitors from the energy industry, the environmental community, and government/political figures who seek direct personal experience of progressive renewable energy solutions.

A typical visual rendering has been provided to depict the views from a key observation point adjacent to the Project site. See Figure 25, Visual Simulation from KOP 6 of a key observation point (KOP) included in Section 6, Maps and Drawings.

5.b. Mitigation Measures

Mitigation measures are identified and described in Appendix F, Conditions of Certification.

6. MAPS AND DRAWINGS

The following maps, plans and drawings that were not included in the text of this document are provided in this section.

Figure 1 Regional Context Solar Assessment Areas

Figure 2 Project Layout

Figure 3 Calico Solar Project Land Ownership Map and Table

Figure 7 Electrical Single Line Diagram

Figure 10 Treated Arterial Roads

Figure 11 Project Access and Layout

Figure 12 Utility Plan

Figure 13 Calico Solar Main Services Complex

Figure 14 Permanent Fencing

Figure 15 9 MW Typical SunCatcher Layout

Figure 16 Site Plan

Figure 20 Existing Project Vicinity Access Routes

Figure 21 Proposed Post Project Development Access Routes

Figure 22 Arizona Crossing

Figure 24 Desert Tortoise Survey Grid and Sightings

Figure 25 Special Status Species Detected During URS Surveys

Figure 26 Visual Simulation from KOP 6

Figure 27 Alternative Project Layout with Northern Boundary Reduced

Figure 28 Offsite Consequence Analysis

SUPPLEMENTARY INFORMATION

1. ENGINEERING AND CIVIL DESIGN

1.a. Facility Survey and Design Drawing Standards

The design and specification of work shall be in accordance with applicable laws and regulations of the federal government, the State of California, and with the applicable local codes and ordinances. The following Laws, Ordinances, Codes and Standards (LORS) have been identified as applying to structural engineering design and construction. The edition and/or addenda to LORS that has been adopted and is in place at time of plant design and construction shall apply to work performed for this facility.

1.a.1. Federal.

Title 29 "Labor," Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health Standards. (29CFR1910)

1.a.2. State.

Business and Professional Code Chapter 7 "Professional Engineers" Sections 6700-6799. Requires state registration to practice as a Civil Engineer or Structural Engineer in California.

Labor Code Section 6500-6510, requires a permit for construction of trenches or excavations 5 feet or deeper where personnel have to descend. This also applies to construction or demolition of any building, structure, false work or scaffolding which is more than three stories high or equivalent.

Title 24, California Codes or Regulations (CCR) Section 2-111, et seq.; Sections 3-100, et seq.; Section 4-106 et seq.; Section 5-102, et seq.; Section 6-TS-769, et seq.; Section 6-T8-3233, et seq.; Section ST8-3270, et seq.; Section 6-T8-5138, et seq.; Section 6-T8-5465, et seq.; Section 6-T8-5531, et seq.; and Section 6-T8-5545, et seq. Adopts current edition of UBC as minimum legal building standards.

State of California Department of Transportation (Caltrans), Standard Specifications.

State of California Occupational Safety and Health Administration (CALOSHA) standards.

1.a.3. County.

San Bernardino County Ordinances can be found on the following website: http://www.amlegal.com/sanbernardinocounty_ca/

1.a.4. Structural Engineering Design Criteria Industry Codes and Standards

1.a.4.1. General Design Requirements and Procedures

The following general design requirements and procedures will be followed in development of project specifications regarding the use of Codes and Industry Standards.

Specifications for materials will generally follow the standard specifications of the American Society for Testing and Materials (ASTM) and the American National Standards Institute (ANSI).

Field and laboratory testing procedures for materials will follow standard ASTM specifications.

Design and placement of structural concrete will follow the recommended practices and the latest version of the American Concrete Institute (ACI), the International Code Council (ICC), California Building Code (CBC) and the Concrete Reinforcing Steel Institute (CRSI).

Design, fabrication, and erection of structural steel will follow the recommended practices and the latest version of the American Institute of Steel Construction Code (AISC) and CBC.

Steel components for metal wall panels and roof decking will conform to the American Iron and Steel Institute (AISI) North American Specification for Design of Cold-Formed Steel Structural Members.

Welding procedures and qualifications for welders will follow the recommended practices and codes of the American Welding Society (AWS).

Preparation of metal surfaces for coating systems will follow the specifications and standard practices of the Steel Structures Painting Council (SSPC), National Association for Corrosion Engineers (NACE) and the specific instructions of the coatings manufacturer.

Fabrication and erection of grating will follow applicable standards of the National Association of Architectural Metals Manufacturers (NAAMM).

Design and erection of masonry materials will follow the recommended practices and codes of the latest revision of the ACI Concrete Masonry Structures Design and Construction Manual, the International Building Code (IBC) and the CBC.

Plumbing will conform to the California Plumbing Code and the International Plumbing Code (IPC).

Design will conform to the requirements of the Federal and California Occupational Safety and Health Administration (OSHA and CALOSHA).

Design of roof coverings will conform to the requirements of the National Fire Protection Association (NFPA).

1.a.4.2. Codes and Industry Standards

The following Codes and Industry Standards shall be used:

California Energy Commission (CEC), "Recommended Seismic Design Criteria for Non Nuclear Power Generating Facilities in California."

International Code Council, "International Building Code" (IBC).

California Building Code (CBC)

Structural Engineers Association of California, "Recommended Lateral Force Requirements and Tentative Commentary."

Applied Technology Council, "Tentative Provision for the Development of Seismic Regulations for Buildings," (ATC-3-06).

American Institute of Steel Construction (AISC).

S335 - "Specification for Structural Steel Buildings-Allowable Stress Design and Commentary."

S303 - "Code of Standard Practice for Steel Buildings and Bridges."

S329 - "Allowable Stress Design Specifications for Structural joints using ASTM A325 or A490 Bolts."

S341 Seismic Provisions for Structural Steel Buildings

M016 - "Manual of Steel Construction Allowable Stress Design."

"Specification for Design, Fabrication and Erection of Structural Steel for Buildings"

American Iron and Steel Institute (AISI)

Specification for the Design of Cold-Formed Steel Structural Members, Edition Cold-Formed Steel Design Manual Parts I-VII

North American Specifications for Design of Cold-Formed Steel Structural Members" All other members will be hot rolled shapes conforming to AISC

AWS D1.1 American Welding Society (AWS) "Structural Welding Code-Steel."

American Concrete Institute (ACI)

ACI 318/318R "Building Code Requirements for Structural Concrete (ACI 318) and Commentary (ACI 318R)"

ACI 318.1 and Commentary - ACI 318.IR

ACI 530 "Building Code Requirements for Concrete Masonry Structures and Commentary (ASCE 5) (TN4S 402)"

ACI 212.3R "Chemical Admixtures for Concrete"

ACI 302.lR "Guide for Concrete Floor and Slab Construction"

ACI 350/350R "Environmental Engineering Concrete Structures."

Structural and Miscellaneous Steel.

ASTM A569/A569M – "Standard Specifications for Steel Carbon (0.15 m maximum percent) Hot-Rolled Sheet and Strip, Commercial Quality."

ASME/ANSI STS-1 – "Steel stacks", except for circumferential stiffening which shall be in accordance with British Standard 4076 and except that seismic design shall be in accordance with LTBC.

American Society for Testing and Materials (ASTM). The following codes and standards shall be included as a minimum:

ASTM A36/A36M "Standard Specification for Structural Steel"

ASTM A53 "Standard Specification for Pipe, Steel Black and Hot-Dipped, Zinc Coated, Welded and Seamless"

ASTM A276 "Standard Specification for Stainless and Heat Resisting Steel Bars and Shapes"

ASTM A500 "Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes"

ASTM A695 "Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel'

ASTM A307 "Standard Specification for Carbon Steel Bolts and Studs – 60000 psi Tensile Strength"

ASTM A153/Al53 "Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware"

ASTM A82 "Standard Specification for Steel Wire, Plain, for Concrete Reinforcement"

ASTM A185 "Standard Specification for Welded Steel Wire Fabric, Plain, for Concrete Reinforcement"

ASTM A615/A615 "Standard Specification Deformed and Plain Billet-Steel Bars for Concrete Reinforcement"

Masonry Institute of America (MIA), "Reinforced Masonry Engineering Handbook"

American Water Works Association (AWWA).

AWWA D100 - "Welded Steel Tanks for Water Storage, (AWS D5.2) "Addendum D100A (AWS D5.2-84A)"

AWWA C301 "Pre-stressed Concrete Pressure Pipe, Steel Cylinder Type for Water and Other Liquids"

AWWA C302 "Standards for Reinforced Concrete Water Pipe Non-cylinder Type, Not Pre-stressed."

American Association of State Highway and Transportation Officials. (AASHTO) (GDHS-2), "A Policy on Geometric Design of Highways and Streets"

National Fire Protection Association Standards (NFPA)

Steel Structures Painting Council Standards (SSPC)

American Society of Nondestructive Testing (ASNT-TC-lA).

Asphalt Institute (AI)

Concrete Reinforcing Steel Institute (CRSI)

1.b. Final engineering and civil design packages for all solar facilities, thermal power conversion facilities, electrical facilities and ancillary facilities that incorporate all mitigation measures developed in the NEPA analysis and incorporated into the final POD

Engineering and civil design for the Project is currently under development: See Appendix R, Preliminary Site Plan.

1.c. Watershed and Drainage Analysis and Calculations

As described in Section 1.c.10, a hydrology study has been completed for the Project site. See Appendix C, Hydrologic and Hydraulic Study.

1.d. Watershed Protection and Erosion Control Design Drawings

See Appendix S, Draft Drainage Erosion Sediment Control Plan (DESCP).

1.e. Final Site Grading Plans

The Project Owner is currently developing site grading plans and will submit such plans when complete.

2. ALTERNATIVES CONSIDERED BY THE PROJECT OWNER

2.a. Alternative Site Evaluation Criteria

There were eight alternative sites that were given consideration in determining the current location of the Project. Each site was analyzed for biological, cultural, land use, and water resource considerations.

2.b. Alternatives Considered but not Carried Forward by Proponent

Alternative site locations were considered but not carried forward for further analysis. The sites were:

Alternative Site #1: Camp Rock Road;

Alternative Site #2: Upper Johnson Valley;

Alternative Site #3: West of Twenty-Nine Palms Military Base;

Alternative Site #4: Interstate 40 South;

Alternative Site #5: Broadwell Lake;

Alternative Site #6: 275 MW Option of Calico Solar (formerly Solar One);

Alternative Site #7: Solar Three (3); and

Alternative Site #8: Solar Six (6).

2.c. Comparative Analysis of Proponent's Alternatives

See Appendix H, Applicant's Submittal of Additional Alternatives Analysis. This document gives a detailed analysis of each alternative evaluated and the findings.

2.d. Alternative Site Configurations

See Figure 26, Alternative Project Layout with Northern Boundary Reduced included in Section 6, Maps and Drawings.

3. FACILITY MANAGEMENT PLANS

3.a. Stormwater Pollution Prevention and Protection Plan

Attached, as Appendix T, is the draft SWPPP. An updated SWPPP will be submitted, when completed.

3.b. Hazardous Materials Safety Management Plan

Attached, as Appendix E, is the draft Hazardous Materials Safety Management Plan.

3.c. Waste Management Plan

Attached, as Appendix U, is the draft Construction Waste Management Plan.

3.d. Worker Environmental Awareness Program (WEAP)

Attached, as Appendix P, is the draft WEAP.

3.e. Health and Safety Plan (meeting OSHA requirements)

See Appendix G, Construction Health and Safety Program.

3.f. Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP)

Attached, as Appendix D, is the draft BRMIMP.

4. FACILITY DECOMMISSIONING

The Project has a minimum expected lifetime of 30 years. When the Project is brought off-line, materials will be disposed of, re-purposed or recycled. The Project will recycle as much material as feasible.

Attached, as Appendix V, is the Draft Closure, Decommissioning, and Reclamation Plan.